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# Swiss Society of Paediatrics
# Abstracts of the annual meeting 2023

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# SWISS SOCIETY OF PAEDIATRICS

# ABSTRACTS OF THE ANNUAL MEETING 2023

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## ORAL COMMUNICATIONS

### OC 1

### Communication strategies in end-of-life decision-making: a perinatal palliative care case analysis

Wenger A[2], Hendriks M J[1,2], Gubler D[2], Fauchère J C[1, 2]

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Discussions between healthcare professionals and parents about end-of-life decisions for a critically ill newborn are highly challenging, especially when the medical outcome is unclear. This study examined the communication between healthcare professionals and parents of a child born with central congenital hypoventilation syndrome. Specifically, decision making about whether to continue life-sustaining treatment or initiate a palliative care pathway was looked at. It explored how healthcare professionals and parents discuss opposing views without losing trust. It also investigated how decision-making roles are defined, and the role of concepts such as best interest and prognostic uncertainty in that process.

This study comprised qualitative and quantitative analyses of audio recordings of the conversations between healthcare professionals and parents. This work focused on one clinical case of a child born with central congenital hypoventilation syndrome. It included six audio recordings, and 33 medical records. These were transcribed, anonymised, and coded. These coded segments were divided into subcategories and analysed.

Over the six recorded conversations, the decision whether life sustaining treatment should be continued or withdrawn, values, fears, and conflicting opinions were discussed. From the beginning, the parents defended the tendency to follow the palliative care pathway, whereby tense situations or conflicts arose. Loss of trust emerged, to which the doctors reacted and tried to intercept. In the end, the healthcare team consented to support the parents' wish and to take the palliative care pathway.

Trust must be ensured in an excellent doctor-parent relationship. The fear that something would happen against the parents' will came up in this case, after which the doctors assured that they would find a pathway together. In such a situation, parents' feelings of fear and guilt should be addressed and normalised, and with that, facilitate the decision-making process. The decision itself is balancing between figuring out how much involved the parents want to be in the decision process, and what represents the child's best interests.

If there is a loss of trust in end-of-life discussions, the underlying fears of parents and health care professionals should be explored and addressed. By finding good communication, it should be elicited regarding who contributes how and what to the final decision-making so the child's best interest can be explored.

### OC 2

### Predictive performance and metabolite dynamics of proton MR spectroscopy in neonatal hypoxic–ischemic encephalopathy

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#### Background

Prognostic value of proton MR spectroscopy (H-MRS) in hypoxic–ischemic encephalopathy (HIE) is acknowledged; however, effects of gestational age (GA) and postnatal age (PA) on prediction and metabolite levels are unknown.

#### Methods

One hundred and sixty-nine newborns with moderate-to-severe HIE were studied, having ≥1 H-MRS scan during postnatal days 0–14 and known neurodevelopmental outcome (Bayley-II score/cerebral palsy/death). Initial scans were categorized by PA (day 1–3/4–6/≥7), and metabolite ratios were compared by predictive value. Metabolite dynamics were assessed in a total of 214 scans performed in the study population, using regression modeling, with predictors GA, PA, and outcome.

#### Results

N-acetyl-aspartate (NAA)/creatine (Cr) and myo-inositol (mI)/NAA height ratios were consistently associated with outcome throughout the first 14 days, with the highest predictive value in the late (≥7 days) period (AUC = 0.963 and 0.816, respectively). Neither GA nor PA had an overall effect on these metabolite ratios, which showed strongest association with outcome ($p < 0.001$). Assessed separately in patients with good outcome, GA became a significant covariate for metabolite ratios ($p = 0.0058$ and 0.0002, respectively). However, this association disappeared in the poor outcome group.

#### Conclusions

In HIE, NAA/Cr and mI/NAA give most accurate outcome prediction throughout postnatal days 0–14. GA only affected metabolite levels in the good outcome group.

### OC 3

### Side-specific diagnostic of lung function: functional matrix pencil decomposition (MP-)MRI in use with children with congenital diaphragmatic hernia

Streibel C[1], Willers C C[1,5], Bauman G[2,3], Pusterla O[1,2,3], Bieri O[2,3], Curdy M[1], Horn M[1], Casaulta C[1], Berger S[4], Dekany G M[4], Kieninger E[1], Bartenstein A[4], Latzin P[1]

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#### Objectives

In patients with congenital diaphragmatic hernia (CDH) the exact functional outcome of the affected lung side is still unknown, mainly due to the lack of spatially resolved diagnostic tools. Functional matrix-pencil decomposition (MP-) lung MRI fills this gap as it measures side-specific ventilation and perfusion. We aimed to assess the overall and side-specific pulmonary long-term outcome of patients with CDH using lung function tests and functional MP-MRI.

#### Methods

Thirteen school aged children with CDH (seven with small and six with large defect-sized CDH, defined as >50% of the chest wall circumference being devoid of diaphragm tissue) and thirteen healthy matched controls underwent spirometry, multiple-breath washout and MP-MRI. Main outcomes were forced expiratory volume in 1 second (FEV1), lung clearance index (LCI), ventilation defect percentage (VDP), perfusion defect percentage (QDP).

#### Results

Patients with a large CDH showed significantly reduced overall lung function compared to healthy controls [mean difference; 95%-Cladjusted.: FEV1 (z-score) -4.26 (-5.61 to -2.92), LCI2.5 (TO) 1.12 (0.47 to 1.76), VDP (%) 8.59 (3.58 to 13.60), QDP (%)

 

17.22 (13.16 to 21.27)] and to patients with a small CDH. Side-specific examination by MP-MRI revealed particularly reduced ipsilateral ventilation and perfusion in patients with a large CDH [mean difference to contralateral side; 95%-Cladjusted.: VDP (%) 14.80 (10.50 to 19.00), QDP (%) 23.50 (1.75 to 45.20)].

**Conclusions**

Patients with a large CDH showed impaired overall lung function with particular limitation of the ipsilateral side. MP-MRI is a promising tool to provide valuable side-specific functional information in the follow-up of patients with CDH.

## OC 4

### Experimental evaluation of complementary therapies in vitro: the example of yellow gentian for respiratory diseases

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**Introduction**

Complementary medicine often lacks evidence of safety and efficacy. In anthroposophic medicine, yellow gentian (Gentiana lutea) is empirically used for the treatment of obstructive airway diseases. In preparation of clinical trials, we aimed to evaluate the safety and efficacy of a standardized preparation of yellow gentian in bronchial epithelial cell cultures in vitro.

**Methods**

Using a watery preparation of gentian root extract (Gentiana lutea Rh 5% Dilutio aquosa, WELEDA AG, Arlesheim, Switzerland), we investigated the effect of yellow gentian in human bronchial epithelial cells (Calu-3 cell line). The effect on epithelial barrier integrity was determined by measurements of the transepithelial electrical resistance (TEER). Concurrently, cell viability was assessed using release of Lactate Dehydrogenase (LDH) as a marker of cytotoxicity. Furthermore, we measured the impact of yellow gentian on Lipopolysaccharide (LPS)-induced cytokine release from Calu-3 cells using Enzyme-linked immunosorbent assay (ELISA).

**Results**

In Calu-3 bronchial epithelial cells, the LPS-induced release of IL-6 and IL-8 could be reduced by exposure of the cells to Gentiana lutea, whereas the cell layer integrity (TEER measurements) was increased. In the toxicity assessment, it was found that Gentiana lutea did not affect cell layer integrity (TEER measurements) or cell viability (LDH release).

**Discussion/Conclusion**

From our in vitro study, we have confirmed the safety and efficacy of using Gentiana lutea as an adjunct to conventional respiratory medical therapies. Clinical trials on this basis would help ensure optimal dosage values. With further studies using other phytotherapeutics, we can help build a body of evidence that will lead to establishing confidence in a complementary medical approach to health and disease.

## OC 5

### Executive functions and primary neurodevelopmental processes in adolescents with congenital heart disease after cardiopulmonary bypass surgery

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**Background**

Children with congenital heart disease (CHD) are at risk for neurodevelopmental impairments, in particular in executive functions (EF). Inhibition, working memory and cognitive flexibility constitute three core EF. In addition, primary neurodevelopmental processes (PNP), namely, attention, processing speed, and fine motor abilities can also be impaired. This study aimed to investigate the association between PNP and EF in CHD patients.

In a prospective cohort study, EF were assessed in 95 adolescents with CHD undergoing cardiopulmonary bypass surgery in infancy at the University Children's Hospital Zurich. A control group of 103 typically developing peers was also recruited. Participants were assessed with an extensive EF test battery, assessing working memory, inhibition, and cognitive flexibility, using the Corsi Block Tapping-Test, and various subtests of the Wechsler Intelligence Scale-IV (WISC-IV) and the Delis-Kaplan Executive Function System. The primary neurodevelopmental processes attention, processing speed, and fine motor abilities were assessed using subtests of the Test of Attentional Performance (measuring alertness), the WISC-IV and the Zurich Neuromotor Assessment. Differences between groups and correlations between functions were assessed using multiple regression analyses (adjusted for parental education, age and sex and corrected for multiple testing) and are expressed as standardized betas.

**Results**

Mean age at assessment was 13.32 years (SD = 1.34) across both groups. Compared to healthy peers, adolescents with CHD showed deficits in all three EF (ßinhibition = .20, ßflexibility = .30; ßworking_memory = .36; all $p < 0.05$ and R2 between 0.10 to 0.28). They performed poorer in alertness and processing speed (ßalertness = .26, $p = .002$, R2 = 0.11; ßprocessing_speed = .28, $p < 0.001$, R2 = 0.18), but not in fine motor abilities (ßfine_motor = 0.07; $p = 0.44$, R2 = 0.03). CHD severity was not significantly associated with EF or PNP. The three EF were correlated with alertness, processing speed and fine motor abilities (ß between 0.17 to 0.57, all $p < 0.05$ and R2 between 0.13 to 0.45).

**Conclusion**

Adolescents with CHD show poorer performance in core EF, in processing speed, and alertness with significant interrelations between these functions. A better understanding of the evolution of impairments will help to improve early detection and tailored interventions.

 

## OC 6

### Incidence of developmental speech and language disorders, and pedysphagia – a population-based study in preschool children in the canton of Zurich.

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**Introduction**

In order to support children with developmental language disorders (DLD) before school entry, identification and referral to speech therapy is key. Also, specific therapies and training for children with pedysphagia (an umbrella term for pediatric dysphagia and feeding disorders) is an important field of expertise of early childhood speech therapists. In the Canton Zurich, a register of all children referred for speech therapy before kindergarten-entry allows to analyze ways of referral, incidences of diagnoses, and granted therapies for these children.

**Methods**

We analyzed the data of all 1491 preschool children referred for speech therapy in the Canton of Zurich in 2016.

**Results**

In 2016, 1491 preschool children were registered for speech therapy in the canton of Zurich. Pediatricians initiated referral for speech therapy more frequently (43.8%) than the parents (34.2%). However, formal referral was mainly performed by pediatricians (77.0%), whereas parents (6,6%), or non-medical specialists (7,6%) registered children less frequently. 1066 children (72.5%, 3;5 years, SD 0;7) were diagnosed with language development disorder, 133 (8.2%, 3;9 years, SD 0;7) had a pronunciation disorder, 65 (4.4%, 3;8 years) had a speech fluency disorder, 52 (3.5%, 3;0 years) suffered from orofacial dysfunction, twelve children had verbal developmental dyspraxia (0.8%, 2;8 years), and 97 children (6.5%, 1;8 years) were diagnosed with pedysphagia.

**Discussion**

We note that language development disorders are the most common problems among preschool children referred for speech therapy in the Canton of Zurich. Pediatricians most frequently identify the children's needs for support, and also were the most frequent formal referrers for further evaluation and therapy. Thus, our results underscore the importance of regular developmental monitoring by pediatricians (e.g., by well-child visits). Such registry-based analyzes of epidemiological data help to find gaps of early identification of preschool children in need of early interventions.

## OC 7

### Adoptively Transferred Donor Memory T Cells Provide Rapid Control of Viral Reactivations after Allogeneic Hematopoietic Stem Cell Transplantation

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Reactivations of latent DNA viruses such as EBV, CMV, HHV6 and ADV are common during the profound immunosuppression following lymphodepleting chemotherapy in allogeneic hematopoietic stem cell transplantation (HSCT). While antiviral therapies provide activity against some of these viruses, their prolonged use bears the risk of substantial toxicity and may promote viral resistance. Specific T cell immunity is essential for long-term control of these viruses, yet its build-up may take months.

Donor-derived virus-specific T cells are highly efficient, exert few side-effects and provide durable activity. However, their isolation in sufficient numbers requires in vitro culture and is thus tedious and costly. An easier and more cost-effective way of enriching antigen-experienced memory T cells is the rigorous depletion of CD45RA-expressing naive T-cells from an apheresis product by using anti-CD45RA antibodies conjugated to magnetic beads in automated cell separators. As part of graft manipulation, the infusion of the resulting memory T-cell fraction together with stem cells was reported in several large studies to be safe, though mainly with adult recipients.

Here, we assessed the efficacy and safety of defined doses of donor memory T cells in seven pediatric recipients of allogeneic HSCT (haploidentical donor n = 4, matched unrelated donor n = 2, matched sibling donor n = 1), which had persistent viral reactivation despite pharmacological treatment or in which antiviral medication was limited due to hemato- or nephrotoxicity.

Seven patients received a total of 14 infusions between 20 and 121 days post-HSCT. Four patients also received a CD34-selected stem cell graft for the treatment of poor graft function (PGF). Serum viral copy number (VCN) for CMV, EBV, HHV6 were routinely screened for at least weekly after HSCT, ADV and BKV upon clinical suspicion. Graft function, signs of GvHD, immune reconstitution and VCN were closely monitored following cell infusion.

The memory T cell infusions were well tolerated. Associated with a marked increase in T-cell expansion, VCN declined substantially or became undetectable within 4-6 weeks after adoptive transfer. In patients with PGF receiving concomitant purified HSC, graft function recovered within 2-4 weeks. One patient developed de novo signs of acute GvHD.

Here we show that early administration of memory T-cells in children post-HSCT is safe, carries a low risk of GvHD and leads to rapid control of viral infection.

## OC 8

### Hematologic factors associated with favourable long-term outcomes in paediatric patients with chronic kidney disease on maintenance haemodialysis

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**Introduction**

In children with chronic kidney disease (CKD), anaemia is defined as haemoglobin (Hb) <11-13.0 g/dL, depending on patient's age and gender. Previous exploratory machine learning in a subpopulation of CKD-5 patients suggested an increased mortality risk with Hb <10.5 g/dL and increased red blood cell distribution width (RDW) >15%. The objective was to evaluate such associations in a traditional time-to-event analysis in a larger population.

**Methods**

Retrospective analysis of a cohort of patients <30 years of age who started chronic hemodialysis (HD) in childhood (≤19 years) and received thrice-weekly HD (2004-2016) in outpatient DaVita centres. Survival at 5 years while remaining on HD was

 

investigated by non-parametric analysis (Kaplan-Meier) stratified by terciles of mean individual Hb and RDW, respectively. A sensitivity analysis was carried out for different subpopulations (<6y/6-12y/>12y at initiation of HD).

**Results**

1493 patients were included with Hb and RDW terciles of <10.7/10.7-11.5/>11.5 g/dL and <14.6/14.6-15.7/>15.7%, respectively. Age at initiation of HD was <6y: n = 66, 6-12y: n = 173, >12y: n = 1254. Both Hb and RDW terciles showed strong associations with survival distributions (P<0.001 for both, log-rank test). Estimated 5-year survival [95%CI] by Hb terciles was 85.1% [81.1-89.3%] (Hb<10.7 g/dL) versus 94.9% [92.5-97.4%] (>10.7-11.5 g/dL) and 93.8% [90.8-97.0%] (>11.5 g/dL), and for RDW 98.6% [97.1-100%] (<14.6%) versus 94.1% [91.3-96.9%](14.6-15.7%) and 84.2% [80.1-88.6%] (>15.7%). Sensitivity analyses confirmed significant associations in patients >12y (P<0.001 for both Hb/RDW) and for RDW in 6-12y patients (P = 0.03 versus P = 0.14 for Hb).

**Conclusions**

This analysis confirmed strong associations between haematologic factors and survival in our population. Clinical utility of RDW in HD management and its physiological interpretation such as importance of specific anaemia forms, or treatment-induced RDW increase in patients requiring more intense treatment remains to be investigated, with potential impacts on existing guidelines for prescribing iron and epoetin therapy. Further studies will also include the time variation trajectories of Hb and RDW.

## OC 9

### Epidemiology of RSV in inpatient care in Switzerland 2016-2021

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**Background**

Respiratory syncytial virus (RSV) is the leading cause of respiratory tract infection and a major cause of hospitalizations in infants and children worldwide. RSV surveillance is limited in Switzerland, and little is known on long-term RSV epidemiology. This study aims to analyse the inpatient epidemiology of RSV as well as the associated healthcare resource utilization (HCRU) and to describe the characteristics of inpatients with RSV in Switzerland. In addition, we analyse the risk factors for hospital admission and complications after RSV infections.

**Methods**

We use data from the national hospital registry that contains all inpatient cases in Swiss hospitals between 2016 and 2021. We identify RSV patients based on ICD-10-GM codes (J12.1, J20.5, J21.0, B97.4) and describe their demographic and clinical characteristics as well as the resource use associated with their inpatient treatment. Furthermore, we estimate the effect of established risk factors on the probability of being hospitalized with RSV in children. Finally, we explore potential long-term sequelae after RSV infections.

**Results**

From 2016-2019, there were on average 4077 inpatients with an RSV diagnosis per year in Swiss hospitals, compared to 2563 in 2020 and 4433 in 2021. For the same time periods, the number of hospitalizations with an RSV primary diagnosis was 2959, 1868, and 3862. Most hospitalizations with an RSV primary diagnosis in the years 2016-2021 were in newborns and young children (age of up to 30 days (10.5%), 31-90 days (24.0%), 91-180 days (14.9%), 181-366 days (16.2%), 1 year (13.4%), 2-4 years (8.3%)). Hospitalization rates of cases with an RSV primary diagnosis were 24.7/1000 (2016-2019 average per year), 13.8/1000 (2020), and 30.8/1000 (2021) in infants, 4.8/1000 (2016-2019 average per year), 3.1/1000 (2020), and 8.6/1000 (2021) in 1-year-olds, and 1.0/1000 (2016-2019 average per year), 0.8/1000 (2020), and 2.4/1000 (2021) in 2-4-year-olds.

**Conclusion**

Our preliminary results confirm that the burden of RSV in Swiss inpatient care is substantial, especially in infants. The seasonal pattern of RSV hospitalizations changed substantially after 2020, which is likely to be caused by measures to respond to the COVID-19 pandemic. RSV hospitalization rates returned to high levels in 2021 after a substantial drop in 2020. Full results including demographic and clinical characteristics, risk factors, HCRU, and sequelae will be available later in 2023.

## OC 10

### 2 years of respiratory syncytial virus epidemoiology in Switzerland - RSV EpiCH a clinician-led national reporting system

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**Introduction**

Respiratory syncytial virus (RSV) is one of the most common causes of respiratory infections in infants and children leading to hospital admission. In Switzerland, RSV infections showed a typical seasonality with peaks during autumn and winter seasons. Following the disruption of RSV circulation during the 2020 / 2021 winter season concurrent to the introduction of nonpharmaceutical interventions against COVID-19, members of the Swiss Pediatric Infectious Diseases Group of Switzerland (PIGS, www.pigs.ch) and representatives of Swiss children's hospitals launched RSV EpiCH, a clinician-led reporting system to monitor the burden of disease due to RSV in children.

**Methods**

Since week 1 2021, we collected aggregated data on the number of RSV tests performed and infections detected at 22 of 29 Swiss children's hospitals. All 7 tertiary care hospitals, 12 of 13

 

secondary care regional hospitals, and 3 of 9 primary care hospitals provided data during the last 2 years. Weekly data, aggregated by age group, were entered on a voluntarily basis into a REDCap database. The data were summarized regionally and regularly made publicly available online in graphical form.

**Results**

Since 4th January 2021 the RSV EpiCH project has recorded 9687 RSV infections in children in Switzerland. 5802 (60%) infections were reported in children younger than 1 year, 1861 (19%) in children between 1 and 2 years, and 2024 (21%) in children older than 2 years. RSV EpiCH provided near real-time data on the out-of-season increase in RSV infections in summer 2021 allowing for locally tailored modification of RSV prophylaxis in at-risk children. Lately, the larger than usual RSV patient load in children's hospitals from October to December 2022 was made visible to the public, illustrating the limited resources available in pediatric care.

**Discussion**

A clinician-led initiative to collect information on the burden of RSV infections in hospitals continues to highlight the regional and national dynamics of RSV infection in Swiss children. RSV EpiCH data have facilitated the adaption of prophylactic measures in at-risk children, provided early information for health care resource allocation in Swiss children's hospitals, and contributed to press and public awareness of RSV.

## OC 11

### Pre-admission management of patients hospitalized with Group A streptococcal (GAS) disease in winter 2022/2023 – should antibiotics have been used more deliberately?

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**Background**

A massive increase of invasive Group A streptococcal infections (iGAS) in winter 2022/23 was reported throughout Europe, raising questions regarding the suitability of the "no-antibiotics" policy for outpatients with GAS pharyngitis and scarlet fever implemented in many countries in recent years.

**Methods**

In a retrospective single center study of medical records, we examined the pre-admission management of all children hospitalized because of a GAS infection between 1 October 2022 and 4 March 2023. Clinical illness compatible with GAS pharyngitis was defined as the presence of acute-onset fever and pharyngitis with absent nasal symptoms and signs. Illness compatible with scarlet fever was defined as the presence of acute-onset fever and a generalized rash judged to be suggestive of scarlatina by the treating clinician. Invasive GAS disease (iGAS) was defined in accordance with the SPSU iGAS study protocol (Swiss Paediatric Surveillance Unit (SPSU) (admin.ch)).

**Results**

Fifty-one cases (median age [IQR], 5.5 [2.4-8.2] years; 38 males) were analyzed. Confirmed iGAS, probable iGAS and non-iGAS accounted for 37, 10 and 3 cases, respectively. Deep-seated eye-ear-nose-throat infections, skin/soft tissue infections, pneumonia, skeletal infections and other foci accounted for 22, 11, 10, 5 and 3 cases, respectively. The median [IQR] delay from onset of symptoms to hospital admission was 6 days [4-8]. In 23 cases (45%), a physician contact took place >24 h before admission. In 5 of these cases (10% of all patients), the clinical presentation at that time was compatible with GAS pharyngitis and/or scarlet fever; 2 of these 5 patients (4% of the entire series) received no oral antibiotic at that time. However, of 28 patients (55%) who were not seen by a physician prior to admission, 11 (22% of all cases) had clinical illness compatible with GAS disease on admission.

**Conclusion**

Only a very small fraction (4%) of cases with severe GAS infection was examined at an outpatient visit >24 h before admission by a physician who opted against antibiotic treatment despite an illness compatible with GAS disease. The data suggest that universal testing and antibiotic treatment of all suspected cases of GAS pharyngitis and/or scarlatina would have had a minimal potential impact in preventing these GAS hospitalizations.

## OC 12

### Tuberculosis case detection and guideline adherence among child contacts in Switzerland: a retrospective observational study

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**Background**

Children exposed to a tuberculosis (TB) index case are at high risk of TB infection and disease. The aim of this study was to assess the yield of contact investigations in children, the adherence to guidelines and the proportion of child contacts diagnosed with TB infection or disease after exposure, and their risk factors for transmission.

**Method**

This retrospective observational study included children ≤16 years of age who had contact to a TB index case and who's examinations were coordinated by the cantonal offices of the Swiss Lung Association between January 2019 and July 2021. Analysis was stratified in the age groups of 0 to 4, 5 to 11 and 12 to 16 years, in line with the different screening approaches recommended for these age groups.

**Results**

Of 401 TB-exposed children, data was available of 380 (95%). Of those, 7 (2%) were diagnosed with TB disease and 35 (8%) with TB infection. The median (interquartile range, IQR) age of included children was 13 (8 to 15) years and 180 (51.9%) were male. We identified several deviations in the execution of contact investigations compared to Swiss guidelines: In the children aged 0 to 4 years, only 82% were examined with an immunodiagnostic test or a chest radiography within two weeks after last contact. Prophylactic treatment is recommended in this age group, but only 66% of the children received any treatment. Of the children aged 5 to 11 years, 64% were tested with an immunodiagnostic test in a first examination and 75% in a second examination, two weeks and two months after last contact, respectively. In univariable and multivariable logistic regression the odds of having TB infection or disease was significantly increasing with contact intensity and the sputum smear result of the index case.

 

**Conclusions**

Contact investigations of children exposed to a TB index case identified a significant proportion of children with TB infection and TB disease in a low TB incidence setting. We observed deviations from the guidelines in the execution of contact investigations and conclude that national guidelines need to be better implemented in clinical practice.

## OC 13

### Screening and whole genome sequencing during an outbreak of Serratia marcescens in a neonatal and pediatric ICU

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**Background**

Serratia marcescens, a Gram-negative bacterium of the Enterobacteriaceae family is found in environmental habitats such as water and is known to account for up to 5% of invasive infections in intensive care units (ICU). Outbreaks especially occur in neonatal ICUs.

**Methods**

Two cases of invasive infections with S. marcescens in infants in the ICU of the University Children's Hospital Zürich prompted an outbreak investigation with infection control measures and screening in neonatal and pediatric ICU patients. S. marcescens isolates were characterized by whole genome sequencing (WGS).

**Results**

Between July 2020 and December 2022, in 41 critically ill children (age 4 days–14 years, 83% <1 year) S. marcescens was detected. 11 patients (27%, median age 32 days) were infected and 30 patients (73%, median age 84 days) were found to be colonized. The infections consisted of septic shock (n = 4), central venous catheter infection (1), meningitis (1), pleuritis (2), ventilator associated pneumonia (2) and urinary tract infection (1). Whole genome sequencing identified 4 different cgMLST (core genome mulitlocus sequence typing) based clusters of S. marcescens. Eight infected and 6 colonized patients belonged to cluster 1 (isolates with ≤8 cg allele differences) which occurred over a period of 15 months. One infected and 1 colonized infant belonged to cluster 2 and 2 colonized children to cluster 3 and 4 each. In 30 of 533 screened patients (5.6%) S. marcescens colonization was detected. 25 (61%) colonized patients had a negative screening on admission indicating hospital transmission. Outbreak measures including patient zone control, reinforcement of hand hygiene, and sensibilization of staff members were implemented from October 2020 in an interdisciplinary team approach. After November 2020 and introduction of screening a further 24 cases were detected over 15 months, prompting further escalation of outbreak control measures. Thereafter, screening during 11 months identified only individual S. marcescens genotypes not related to the outbreak.

**Conclusion**

We demonstrate the impact of screening and WGS to manage an outbreak of S. marcescens. Screening and WGS only identified the full extent of the outbreak and underlined the continued need for enhanced efforts for implementation of infection control measures to end the outbreak. If clinical alertness for infections and readiness to promptly implement actions is optimized, nosocomial infections can be limited.

## OC 14

### Violence in Pediatrics - where are the limits?

Lips U[1]

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**Background**

Pediatricians regularly use violence against their patients by performing procedures that are painful. Especially the younger child cannot be informed directly about the forthcoming intervention and thus cannot give an opinion. In pediatric practice, these are mainly vaccinations and blood sampling, in the clinics additionally infusions, catheterizations of the urinary bladder and lumbar punctures.

Viewed in isolation from the point of view of criminal law, such interventions constitute a "simple assault". Of course pediatricians act in the best knowledge and conscience of the patient and have the patient's best interests in mind. However, they should be aware that conditions must be met for the performance of such violations in physical integrity. These conditions are explained on the basis of the relevant passages in the Swiss Civil Code (ZGB) and the SAMW guidelines "Coercive measures in medicine".

**Topics**

Even if legitimacy for an intervention is given, the pediatrician must strive to make all interventions as painless as possible for the child.

Repeated performance of a procedure by the same health professional due to primary failure is usual in pediatric hospitals. There is a difficult dilemma between the patient's comfort and the training mandate: if an inexperienced person is never allowed to "practice", he or she will not be able to learn the procedure, whereas patient comfort is optimally ensured if primarily the most experienced person is consulted.

**Hypotheses**

Pediatricians pay too little attention to pain relief during interventions.

In pediatric hospitals there exist no strict regulations who may perform an intervention and how often.

**Method**

In a survey, Swiss children's hospitals were asked

1. how pain reduction during interventions is regulated and
2. if there exists a regulation, how often a single person is allowed to perform a procedure

**Results and conclusions**

Results of this survey will be presented and compared with the hypotheses; conclusions are derived.

## OC 15

### Down Syndrome: Lifetime burden of disease on nationwide hospitalization data

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**Introduction**

Down Syndrome (DS) is one of the most common chromosomal disorders. Affected individuals form a distinct patient group with a variety of associated functional disabilities and somatic

 

manifestations, affecting neurological, cardiovascular and other systems. However, little is known about the medical burden of DS and associated severe conditions requiring hospitalization throughout lifetime.

**Design and Methods**

This is a population-based nationwide cohort study using administrative claims data in Switzerland from January 1, 2012 to December 31, 2020. We identified all hospitalizations of patients with a diagnosis of DS and investigated incidence rates, main causes of hospitalization, as well as in-hospital outcomes (in-hospital mortality, length of hospital stay, and rate of intensive care treatment) compared to the general population (control group) and stratified by three age groups: neonates and infants (0-12 months), children and adolescents (1-17 years), and adults (≥18 years).

**Results**

Among 5'697 hospitalizations with DS (mean age 28.3 years [SD 24.0], 3'491 [61.3%] males), the highest incidence rates were observed in the pediatric age group (DS 45.1% vs. controls 7.2%). Main reasons for hospitalization for DS vs general population controls were conditions of the circulatory system (DS 33.9% vs. controls 2.5%) vs. infectious diseases (controls 33.0% vs. DS 24.7%) in neonates and infants, and infectious diseases (DS 26.1% vs. controls 16.2%) for both DS and controls in children and adolescents, and infectious diseases (DS 21.6% vs. 5.4%) vs musculoskeletal system (controls 14.6% vs. DS 6.0%) in adults. Children with DS featured a high medical complexity already after birth with on average six comorbidities, a value only observed at the age of 69 years on average in controls. Patients with DS had worse in-hospital outcomes among all three age groups and over lifetime with a longer hospital stay by 1.7 days [95% CI, 1.7 to 1.8], a higher ICU admission rate (OR 14.2 [95% CI, 13.6 to 14.9]), and higher all-cause in-hospital mortality (OR 1.9 [95% CI, 1.6 to 2.3].

**Conclusion**

Individuals with DS have a high burden of disease already at time of birth requiring repeated in-hospital treatments, especially during early childhood. Once hospitalized, they are at increased risk of adverse in-hospital outcomes with prolonged hospital stay, higher mortality and higher ICU admission rates.

## OC 16

### Urine collection techniques in non-toilet trained children: Switzerland's paediatric office practices in 2022

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**Background**

Urinary tract infections (UTI) are common in children. Various paediatric scientific societies have issued recommendations on urine collection methods for UTI diagnosis. The midstream clean-catch (CC) sampling is performed easily when the child urinates on demand but is tedious in non-toilet trained children. In this case, several methods of urine collection are available: trans-urethral bladder catheterisation (CATH); suprapubic bladder aspiration (SPA); in a collection bag (CB) adhering to the periurethral skin; CC urine collection relying on stimulation methods (Quick-Wee/bladder lumbar stimulation). 2021 Swiss guidelines recommend SPA and CATH for urine culture but consider the CC methods as valid alternatives. CB sampling is to be used only to exclude a UTI. The literature shows discrepancies between practice guidelines and reality on urine collection methods for non-toilet trained children.

**Objectives**

This study aimed to establish the current office-based Swiss general paediatricians' practices regarding urine collection methods. In addition, a comparison with the recently published Swiss guidelines was made, and constraints to urine collection were investigated.

**Methods**

Between 14.01. and 10.03.2022, Switzerland's office-based paediatricians were invited through their newsletters to participate in an online-survey (LimeSurvey GmbH, Hamburg, Germany). Data analysis relied on R statistical software. Multinomial logistic regressions were used for comparative statistics. The association of paediatricians' demographic characteristics with urine collection methods was tested.

**Results**

Of 1280 paediatricians, 356 answered and 258 (20%) responses were included. Mean age was 49 years. Paediatricians age was significantly associated with the choice of collection technique. CC or CATH methods were used primarily by 17% to 35%, resp. 3% to 30% of paediatricians depending on the child GC. 44% (44/100) of paediatricians used first-line CB only to exclude UTI. The main barriers to follow official Swiss urine collection guidelines are the felt invasiveness of the CATH and SPA methods (87%; 173/200), the lack of time (68%; 136/200) and the lack of staff (60%; 120/200).

**Conclusion**

The recommended urine collection techniques are still underutilized by office-based paediatricians in Switzerland. Although CB is non-invasive and easy to use, it carries a high risk of contamination. Barriers to proper urine collection techniques must be overcome.

## OC 17

### Differences between pre-pandemic and pandemic (COVID-19) pediatric health service utilization in Switzerland. Analyses of Swiss insurance data between 2018 and 2022

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**Background**

During the COVID-19 pandemic, morbidity and mortality significantly increased. Various measures have been implemented by the Swiss government to curb the epidemic, including a lockdown and restrictions of elective and non-urgent medical care in the early phase of the pandemic. Young children were partly exempt from these restrictions with the recommendation that screening and vaccination visits should be adhered to. Thus far, it is unclear whether vaccinations, screening visits or other pediatric health services were forgone or delayed in Switzerland.

**Aim**

To illustrate changes in the pandemic vs. the pre-pandemic phase for different pediatric health services in 0-18-year-olds living in Switzerland.

 

**Methods**

Interrupted Poisson time-series models were used to compare pre-pandemic with pandemic utilization by using national health insurance data.

**Results**

For some health services, lower average utilization rates in the pandemic vs. the pre-pandemic phase seemed to be attributable to an initial marked drop in utilization immediately after the lockdown. This pattern was significant in the youngest age group (0-5y) for basic consultations, checkups, and urgent consultations/visits. For other health services, including telephone consultations (all age groups), utilization rates were higher in the pandemic vs. the pre-pandemic phase. No coherent pattern was found regarding vaccinations: In the youngest age group (0-5y), average vaccination rates were lower in the pandemic vs. the pre-pandemic phase for some vaccinations (measles/mumps/rubella), whereas no pandemic effect or even increased vaccination rates were found for others. Normalizations after the lockdown were observed for some services and age groups over the subsequent weeks and months, aligning to the pre-pandemic levels of utilization (i.e., increase after an initial drop; decrease after an initial rise).

**Discussion**

Utilization of pediatric health services in Switzerland was significantly affected throughout the pandemic, with the strongest impact directly after the lockdown. However, the pandemic did not have a uniform effect on the utilization. There are differences by service, age groups, direction of effect and in the recovery patterns across the pandemic phase. Some services may have been substituted by other services such as in-person visits by telephone consultations, while others might have been postponed or the actual service demand may have changed.

## OC 18

### The impact of the COVID-19 pandemic on pediatric emergency department utilization in three different language regions: assessment of trends and diagnosis-specific analyses

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**Background**

The COVID-19 pandemic has resulted in increased morbidity and mortality, particularly among the elderly and people with preexisting diseases. In response, the Swiss government regulated containment measures, including a lockdown, which primarily aimed to prevent overcrowding in emergency departments (EDs) and intensive care units for adult patients. In contrast, exceptions for patients requiring immediate medical attention were communicated. However, the effects of the pandemic on pediatric visits in Switzerland are unclear. Therefore, we aimed to analyze changes in the use of pediatric EDs throughout the pandemic.

**Method**

Weekly data from pediatric ED visits in three tertiary centers (Zurich, Geneva, Bellinzona) were analyzed. Interrupted time-series modelling was used to determine the effects of the pandemic on the utilization of pediatric EDs, comparing pre-pandemic data (03/2018-03/2020) with data after the lockdown period (05/2020-02/2022). In addition, diagnosis-specific analyses of ED visits to Zurich were performed (March and April).

**Results**

A total of 301'754 visits were used to model the dynamics of ED visits. At the onset of the lockdown, a drop of nearly 50% in the number of ED visits was observed, followed by a gradual catch-up until the second half of 2021 when the number of ED visits reached pre-pandemic levels. This pattern mostly affected the youngest age group (0-4 years old) and was similar for patients with non-urgent and urgent medical conditions in all three regions. However, the decrease in urgent visits appeared more pronounced in Zurich and Geneva than Bellinzona. Accordingly, hospitalization in Bellinzona did not decrease significantly during the pandemic, in contrast to the findings of Zurich and Geneva. Detailed analyses of diagnostic groups found a decrease of 53.3% in viral infections (respiratory and gastrointestinal) in 2020 compared with 2019, whereas the decrease in trauma patients was only 17.3%.

**Conclusions**

Despite official recommendations, pediatric ED visits halved after the lockdown in all three language regions, affecting mostly infants and toddlers. Viral infections showed the largest decrease. Hospitalizations remained at the pre-pandemic level in Bellinzona, in contrast with those in Zurich and Geneva. Our study provides insights into pediatric ED utilization during the COVID-19 pandemic, which is relevant for health management in the aftermath of the pandemic and in similar future circumstances.

 

## SWISSPEDNET

### SPN 1

#### Effects of parental smoking on pulmonary outcomes in young childhood cancer survivors

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**Background**

Passive exposure to cigarette smoke has negative effects on respiratory health. Childhood cancer survivors (CCS) are at an increased risk for pulmonary disease due to treatment regimens that may harm the respiratory system. The objective of this study was to evaluate the prevalence of parental smoking and effects on pulmonary outcomes in childhood cancer survivors.

**Methods**

As part of the Swiss Childhood Cancer Survivor Study, we sent a questionnaire to survivors aged ≤19 years who were diagnosed with cancer between 1976–2010 and survived >5 years. Parents completed the questionnaire for survivors aged <16. Participants reported on pulmonary outcomes including chronic cough persisting for longer than 3 months, recurrent pneumonia, and asthma, and on parental smoking status. We used logistic regression models adjusted for age and sex to investigate the association between parental smoking and pulmonary outcomes.

**Results**

Our study included 1331 survivors (response rate 71%). Median age at survey was 15 years (interquartile range [IQR] 12–17). Eighteen percent of mothers reported active smoking and an additional 22% were ex-smokers. Among fathers, 22% were active smokers and 23% ex-smokers. Chronic cough was reported by 42 survivors (3%), recurrent pneumonia by 65 (5%), and asthma by 94 (7%). Survivors exposed to mothers who were active smokers were more likely to report chronic cough (OR = 2.4; 95% CI 1.2–4.9) in comparison to non-smoking mothers. We found no association with asthma or pneumonia and no association with paternal smoking.

**Conclusion**

This study found that a substantial proportion of CCS had parents who smoked. Exposure to maternal smoking was associated with higher prevalence of chronic cough in survivors. We should increase investments

### SPN 2

#### Diagnosis in children with prolonged or recurrent cough: findings from the Swiss Paediatric Airway Cohort

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**Introduction**

Prolonged or recurrent cough in children has different underlying causes, which vary across settings and age. We assessed diagnostic testing, final diagnosis given, and treatment prescribed to children visiting respiratory outpatient clinics in Switzerland.

**Methods**

We analysed data from the multicentre Swiss Paediatric Airway cohort study. We included 363 children (median age 6 years, range 0-16, 60% male) referred for prolonged or recurrent cough. We extracted information on diagnostic investigations, final diagnoses proposed by paediatric pulmonologists, and treatment prescribed from outpatient records.

**Results**

Final diagnosis was asthma and asthma-like conditions in 133 (37%), respiratory tract infections (RTI) including protracted bacterial bronchitis in 50 (14%), upper airway cough syndrome (UACS) in 47 (13%), post-infectious cough in 36 (10%), and unknown or other diagnoses in 97 (27%). Diagnoses differed by age ($p<0.001$). Among preschool children (<5 years old), 27% had asthma and asthma-like conditons, 24% RTI, 15% UACS, and 11% post-infectious cough while among schoolchildren (≥ 5 years old), 42% had asthma and asthma-like conditions, 12% UACS, 9% post-infectious cough, and 8% RTI. The most common tests done were fractional exhaled nitric oxide (73%), lung function i.e. spirometry or body plethysmography (71%), and allergy tests (71%). Chest X-rays were done in 25%. Most children (83%) diagnosed with asthma were prescribed inhaled corticosteroids, alone or in combination with long-acting beta agonists, 42% of the children with RTI were prescribed antibiotics and 83% of those diagnosed with UACS were prescribed nasal corticosteroids.

**Conclusion**

Asthma was the most common diagnosis, in about a third of the children. Final diagnoses differed strongly by age. The cause of cough was unknown in 20% of the children, highlighting the diagnostic challenge and the need for further research to improve diagnosis of prolonged and recurrent cough.

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## SPN 3

### Physical activity in children with primary ciliary dyskinesia

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#### Background

Physical activity is important for general health and facilitates sputum expectoration in children with primary ciliary dyskinesia (PCD). We studied physical activity in children with PCD participating in the international COVID-PCD study.

#### Methods

We included children aged 3-17 years. A baseline questionnaire assessed physical activity levels and weekly questionnaires assessed duration of mild, moderate, and vigorous activity on the previous day. We studied number of active days and number of days children reached the WHO recommended 60 minutes (min) of moderate-to-vigorous activity (MVA) per day. We used multilevel mixed effects linear regression to study factors associated with daily min of MVA.

#### Results

We included 227 children with PCD from Switzerland (n = 14;6%), Germany (n = 42;19%), England (n = 38; 17%), USA (n = 35;15%), Australia (n = 15; 7%), and 23 other countries. Median age was 9 years (range 3-17), and 103 (45%) were female. At baseline, 78 (36%) were not regularly active, 37 (17%) were irregularly active, and 101 (47%) were regularly active. During a median of 17 (range 2-78) weeks of follow-up, children were active on 76% of days and reached the WHO recommended 60 min MVA on 20% of days. We found that several factors were associated with less daily MVA. Adjusted for season and weekday, female sex (-17 min, 95%CI -31 to -4) and age 14-17 years compared to children aged 6-9 years (-24 min, 95%CI -42 to -6) were associated with less daily min of MVA. Children from Switzerland reported more min of daily MVA (30 min, 95%CI 2 to 85) compared to children from England. Current symptoms, hospitalization in the past year, and BMI z-score were not associated with daily MVA.

#### Conclusion

Many children were less active than recommended by the WHO, especially girls and teenagers. Increasing physical activity in people with PCD is recommended to reach the WHO guidelines.

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## SPN 4

### Feasibility of collecting genetic information from people with a rare disease using questionnaires

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#### Background

It is difficult to collect information about genetic mutations from hospital records due to confidentiality issues. This is especially difficult for rare diseases. We studied feasibility of collecting information about specific genetic mutations using an online questionnaire among people with primary ciliary dyskinesia (PCD) and studied validity of the collected data.

#### Methods

We used data from the COVID-PCD, an anonymous international participatory study including people with PCD of any age from anywhere in the world. A baseline questionnaire asked about diagnostic testing including genetic tests and results. Among study participants who reported to have genetic testing done, we calculated how many reported that a disease-causing genetic mutation had been found and how many knew the specific mutation. For validation, we compared the relative frequency of reported genetic mutations with data from the United Kingdom (Shoemark, ERJ, 2021) and studied the frequency of laterality defect among persons with mutations affecting radial spoke or the central complex (RSPH4A, RSPH1, HYDIN, RSPH9, RSPH3) of respiratory cilia - mutations not associated laterality defect. We studied differences between children and adults.

#### Results

Among 739 participants coming from the United Kingdom (20%), USA (18%), Germany (14%), Italy (8%), and Switzerland (7%) and other countries (33%), 430 (58%) had genetic testing done. 280 reported that a PCD-causing mutation was found of which 202 (72%) reported the specific mutation. Among the 255 children, specific genetic mutation could be retrieved for 100 (39%) while it was retrieved for 102 of 483 (21%) of adults. In total, participants reported 27 different mutations and the most common were DNAH5 (n = 71, 35%), DNAH11 (n = 22,11%), CCDC40 (n = 19,9%), DNAI1 (n = 17, 8%), and CCDC39 (n = 13, 6%). This is in line with results from other published studies. Only 1 person (5%) in the CC gene group reported laterality defect compared to 47% in the rest of the population.

#### Conclusion

Our results suggest that it is feasible to collect detailed genetic data from people with a rare disease, particularly from children, with good validity.

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## SPN 5

### FIRST RESULTS OF A NOVEL COMMUNITY-BASED SCREENING PROGRAM FOR HEARING LOSS IN CHILDHOOD CANCER SURVIVORS: THE HEAR-STUDY

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#### Background

Hearing loss is a potential adverse event of childhood cancer treatments, with negative consequences on education, social interaction, and quality of life. Early detection and timely therapeutic support may help minimize the burden of hearing loss in childhood cancer survivors (CCS).

#### Aims

Conduct and evaluate feasibility of a national, low-threshold screening program for detecting hearing loss in CCS.

#### Methods

We invited 1606 CCS diagnosed before age 21, ≥5 years post-diagnosis, aged 18 or older and registered in the Swiss Childhood Cancer Registry to visit a nearby hearing aid shop. CCS receive standardized pure-tone audiometry in the shops for free and receive a print-out of the results to share with their physician. Participants fill out a baseline questionnaire before and two follow-up questionnaires after visiting the shop. Some CCS are invited for semi-structured interviews. Questionnaires and interviews aim to assess participants experiences with the program and to understand their opinions and needs. Data are analyzed following a mixed methods approach.

#### Results

Until now, 464 (29% of contacted) CCS consented to participate, 50% female, median age 33 yrs (range 18-59). Three-hundred-seventy (80%) completed the baseline questionnaire, and 234 (50%) went for a hearing test. Interviews are ongoing. Preliminary results suggest that most survivors perceived the testing opportunity at the hearing aid shop as positive. The participants liked the detailed explanation of the test sequence by the acoustician (n = 42, 18%) and the fast test procedure (n = 16, 7%). The most common problem during the hearing test was distracting background noise when no soundproof chamber was available (n = 25, 11%).

#### Conclusions and outlook

The HEAR study is evaluating a novel, simple, low-threshold approach to screen for hearing loss in CCS. First results indicate that this approach could support and supplement existing follow-up programs, particularly in CCS with less severe late effects.

## SPN 6

### Trends and social differentials in child mortality in Uganda: Results from four Demographic Health Surveys

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#### Background

Uganda faces a challenge of high child mortality, missing the United Nations Sustainable Development Goals target for reducing neonatal mortality to at least as low as 12 deaths per 1,000 live births and under-5 mortality to 25 per 1,000 live births by 2030. This target is still high compared to Switzerland's neonatal mortality of 3 deaths per 1,000 live births and under-5 of 4 per 1,000 live births. We describe the trends and study relevant factors in neonatal and under-5 mortality in Uganda between 2001 and 2016.

#### Methods

We used data from 4 Demographic Health Surveys conducted in 2001, 2006, 2011, and 2016 in Uganda, containing data on 38,882 children born between 2001 and 2016 to women aged 15-49 years. We calculated neonatal mortality rate as the number of children who died before the age of 30 days per 1,000 live births, and under-5 mortality as the number of children who died before the age of 5 years per 1,000 live births in the five years preceding the survey. We studied neonatal and under-5 mortality rates over time, stratified by residence (rural or urban), mother's age, mother's education, and household wealth.

#### Results

Neonatal mortality remained stagnant at 33/1000 live births (95%CI 28-39) in 2001, 27/1000 (95%CI 23-31) in 2006, 27/1000 (95%CI 22-32) in 2011, and 27/1000 (95%CI 24-30) in 2016. Neonatal mortality decreased from 35/1000 (95%CI 29-40) in 2001 to 26/1000 (95%CI 23-30) in 2016 in rural areas and increased from 21/1000 (95%CI 12-30) in 2001 to 28/1000 (95%CI 20-36) in 2016 in urban areas. In contrast, under-5 mortality in Uganda decreased over time from 159/1000 live births (95%CI 144-173) in rural areas and 93/1000 (95%CI 74-113) in urban areas in 2001 to 68/1000 (95%CI 62-73) rural areas and 52/1000 (95%CI 41-63) in urban areas in 2016. Under-5 mortality declined in household wealth categories from 192 (95%CI 169-215) in the lowest wealth quintile and 106 (95%CI 91-122) in the highest quintile in 2001 to 88 (95%CI 80-97) in the lowest and 53 (95%CI 44-61) in the highest quintile in 2016. Under-5 mortality was higher among women with no education (45/1000 live births) compared to women in the higher education category (22/1000 live births) in 2016.

#### Conclusion

There is a need for a combination of efforts and interventions to reduce child mortality in Uganda. The neonatal mortality stagnation for 15 years in a row needs an urgent review at the policy level.

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## SPN 7

### Discrimination of tuberculosis infection and disease using cytokine response to novel M. tuberculosis antigens

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#### Background

Interferon-γ release assays (IGRA) have limited sensitivity in children with tuberculosis (TB) disease and do not distinguish TB infection (latent TB) from disease (active TB). In IGRA lymphocytes are stimulated in vitro with ESAT-6/CFP-10 and production of IFN-γ is measured. The diagnostic performance of tests using novel stimulatory antigens and additional cytokines to distinguish TB infection from disease is the aim of this study.

#### Methods

In this prospective, multicentre, diagnostic, observational study in Switzerland children <18 years of age with TB infection, disease, or TB exposed non-infected were included. Whole blood was stimulated with ESAT-6/CFP-10 and 5 novel M. tuberculosis antigens. The following cytokines in supernatant were analysed with Luminex technology: TNF-α, sCD40L, IP-10, IL-6, IL-2, IL-1RA, IL-17, IL-13, IL-10, IFN-γ and GM-CSF. Descriptive statistics and machine learning algorithms including random forest (with 4-fold cross validation) were used to find most discriminative cytokine/antigen pairs. Cytokine values were normalised per cytokine to achieve comparability.

#### Results

In total 107 children were enrolled in the study of which 24 (22%) children had TB disease, and 28 (26%) TB infection. Median age was 8.9 (IQR 3.4-12.1) years and 60 (56%) were female.

The stimulatory antigens ESAT-6/ CFP-10, Rv2346/47c-and Rv2031c-induced the largest difference in cytokine concentration in children with TB disease or infection versus exposed non-infected children. In addition to IFN-γ (used in IGRA), IP-10 and IL-2 combined with these antigens perform best. A random forest model to distinguish children with TB disease or infection from exposed non-infected children performed with an area under the curve (AUC) of 0.89 (+/- 0.07) and the most informative cytokine/antigen pairs were IL-2/ESAT-6/CFP-10, IP-10/RC2346/47 and IP-10/ Rv2031c. A random forest model to distinguish children with TB disease from children with TB infection performed with an AUC of 0.72 (+/- 0.17) and most informative cytokine/antigen pairs were IL2/Rv0081, IFN-γ/Rv2431 and IL-17/RV0081.

#### Conclusion

This study confirms that novel cytokine-antigen pairs improve sensitivity compared to commercially available IGRAs. The discriminatory potential for these cytokine/antigen pairs to distinguish TB infection and disease is not yet optimal. Part of these results were shown at the research day of the Department of clinical Research at the University of Basel.

## SPN 8

### Chronic health conditions after childhood Langerhans cell histiocytosis: Results from the Swiss Childhood Cancer Survivor Study

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#### Background

Langerhans cell histiocytosis (LCH) is a rare disease characterized by the dysregulated proliferation of Langerhans cells and subsequent organ infiltration. The prognosis is in majority of cases favourable, but some LCH survivors experience chronic health conditions (CHC) resulting from this disease. We aimed to evaluate the spectrum and prevalence of CHC in LCH survivors compared to siblings of childhood cancer survivors and to identify factors associated with CHC.

#### Methods

The Swiss Childhood Cancer Survivor Study sent questionnaires to all ≥5-year LCH survivors registered in the Swiss Childhood Cancer Registry and diagnosed between 1976 and 2015. Siblings of childhood cancer survivors received a similar questionnaire. We standardized siblings for sex, age at study, migration background, and Swiss language region based on the distribution in survivors. We compared CHC prevalence between survivors and siblings and used logistic regression adjusted for sex and age to identify CHC determinants.

#### Results

We included 123 LCH survivors (response rate 69%) with a median time since diagnosis of 13 years (interquartile range [IQR] 9–20) and median age at study of 20 years (IQR 15-26). LCH survivors were more often male (63%). We also included 866 siblings. Fifty-nine percent of LCH survivors had one or more CHC while only 48% of siblings had one or more CHC ($p = 0.02$). Cardiovascular (13% vs. 6%), endocrine (15% vs. 1%), musculoskeletal (22% vs. 12%), and digestive (15% vs. 8%) CHC were more prevalent in LCH survivors than siblings (all $p<0.05$). Factors most strongly associated with occurrence of CHC were multisystem LCH, multifocal bone involvement, and involvement of pituitary gland.

#### Conclusions

More than half of long-term LCH survivors suffered from one or more CHC. Clinicians in paediatric cancer follow-up programs should be aware of possible cardiovascular, endocrine, musculoskeletal, and digestive conditions in LCH survivors.

 

## SPN 9

### Learning from success stories: Neurodevelopmental resilience in adolescents with congenital heart disease is linked to a positive family environment

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Neurodevelopmental impairments are the most common non-cardiac comorbidity in patients with congenital heart disease (CHD). However, there is a large variability in neurodevelopmental outcomes. While some patients have clinically relevant impairments, others remain resilient and develop normally. We aimed to investigate different neurodevelopmental profiles among patients with CHD and to identify factors associated with having a resilient neurodevelopmental profile.

One-hundred patients with CHD between 10 and 15 years (39% females) underwent neuropsychological evaluation. Summary scores were calculated with normative data for intellectual functions (IQ) and executive functions (EF). Parents completed standardized questionnaires on their child's EF and behavior in everyday life and on the family environment. Clinical data was obtained from patient charts. Latent profile analysis (LPA) was conducted with z-transformed data to identify different neurodevelopmental profiles. Logistic regression was used to investigate clinical and family factors associated with neurodevelopmental profiles.

LPA identified two distinct groups of neurodevelopmental profiles. Group 1 (n = 57) was characterized by a resilient profile (Mean[sd]: IQ = 0.3[0.7], EF = -0.9[1.1], EF in everyday life = 0.5[0.6], behavior = -0.2[0.3]). Group 2 (n = 43) was characterized by a vulnerable profile (Mean[sd]: IQ: = -0.5[1.0], EF = -1.9[1.6], EF in everyday life = -1.5[0.6], behavior = -1.3[0.5]). The resilient group performed significantly better in all outcomes compared to the vulnerable group (all $p<0.001$). The resilient group had significantly better family functioning (OR = 0.81, p = 0.01), better parental mental health (OR = 1.08, p = 0.03) and higher socioeconomic status (OR = 0.73, p = 0.01) compared to the vulnerable group. Clinical factors were not significantly associated with group (gestational age, birth weight, CHD severity, surgical factors, hospitalization time, all $p>0.06$).

While adolescents with CHD are at risk for neurodevelopmental impairments, many patients are resilient and develop normally despite having a chronic illness. A positive family environment is protective for neurodevelopment and may outweigh the role of clinical factors. These findings underline the importance of family-centered care to promote favorable patient outcomes in the long term and may provide important information to develop tailored interventions for patients at risk for neurodevelopmental impairments.

## SPN 10

### Preterm-born adolescents of the surfactant era show mild structural lung disease

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Children born premature are at risk of developing bronchopulmonary dysplasia (BPD) and long-term respiratory morbidity. Advances in neonatal care, such as surfactant therapy have improved preterm survival. However, data on long-term respiratory morbidity is scarce. The aim of this study was to compare lung structure and function in preterm-born adolescents from the surfactant era to matched term-born controls.

**Methods**

Participants performed forced expiratory volume in 1s (FEV1), structural and functional MRI. Perinatal data was retrieved from patient records. Structural MRI was performed with standard protocol and an ultra-short echo sequence with 1.5mm resolution. Scoring was performed by four radiologists (range 0-48). Functional MRI was done with matrix pencil MRI during free breathing and without contrast agent, assessing ventilation and perfusion defect percentage. Mann-Whitney-, t-test and regression analysis was performed.

**Results**

We included 90 preterm (mean ±SD age, 16 ±2.0 years) and 100 term-born participants (16 ±1.4 years). In the preterm group, mean gestational age was 28.9 ±2.7 weeks, birthweight 1.15 ±0.5 kg, and 19% showed mild, 28% moderate and 18% severe BPD. Preterm-born adolescents showed mild, but significantly more structural abnormalities than controls (median score 0 in both groups, range 0-9 vs 0-2 in controls, $p<0.001$). Functional MRI was not systematically different. FEV1 z-score was significantly lower in the preterms compared to controls (mean difference (95%CI) -0.9 (-1.2;-0.6), $p<0.001$). Having any structural pathology (score ≥1, in 20% of preterms) was associated with the duration of intubation and CPAP. Preterms with moderate to severe BPD showed significantly more structural abnormalities than those with mild or no BPD. Structural MRI and FEV1 did not correlate.

**Discussion**

We found systematically more structural lung abnormalities in preterm-born adolescents of the surfactant era compared to term-born controls. Pathology was present in 20% of the preterms and overall mild. This contrasts pre-surfactant era data, reporting pathologies in >85% of cohorts. Structural lung abnormalities were pronounced in preterms with more severe BPD and longer ventilation support. Moreover, our cohort showed significant airway obstruction. Longitudinal follow-up is needed to determine the clinical and pathophysiological consequences, since there is substantial concern these changes increase susceptibility to chronic obstructive pulmonary disease.

## SPN 11

### Methylprednisolone Versus Intravenous Immunoglobulins in Children with Paediatric Inflammatory Multisystem Syndrome Temporally Associated with SARS-CoV-2: A Randomised Multicentre Trial

Welzel T[1,2,3], Atkinson A[1], Schoebi N[4], André MC[5,6], Bailey DGN[7], Blanchard-Rohner G[8], Buettcher M[2,9,10], Grazioli S[11], Koehler H[12], Perez M-H[13], Trueck J[14], Vanoni F[15,16], Zimmermann P[17,18], Sanchez C[1], Bielicki JA[1,19], Schlapbach LJ[20,21], for the Swissped RECOVERY trial

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#### Background

The emergence of Paediatric Inflammatory Multisystem Syndrome temporally associated with SARS-CoV-2 (PIMS-TS) led to widespread use of anti-inflammatory treatments in the absence of randomised controlled trials (RCT). We aimed to determine the effectiveness of intravenous (iv) methylprednisolone compared with iv immunoglobulins (IVIG) on length of hospital stay (LoS) in children hospitalized with PIMS-TS.

#### Methods

This open-label, multicentre two-arm RCT was conducted at ten Swiss hospitals in children aged <18 years with PIMS-TS. Patients were randomized 1:1 to iv methylprednisolone (10 mg/kg/day for three days) or IVIG (2 g/kg as a single slow infusion). The primary outcome was LoS censored at day 28, death, or discharge. Secondary outcomes included proportion and duration of organ support. Analyses were intention-to-treat (ITT). Ethic approval was obtained. An independent data monitoring committee monitored trial safety. Trial registration: SNCTP000004720; NCT 04826588.

#### Findings

Between May 21, 2021, and April 15, 2022, 75 patients with a median age of 9.1 years [IQR 6.2, 12.2] were included in the ITT and randomly allocated to methylprednisolone (n = 37) versus IVIG (n = 38). The median LoS was 6.0 days [IQR 4.0 to 8.0] in the methylprednisolone and 6.0 days [IQR 5.0 to 8.8] in the IVIG arm (estimated effect size -0.037 of the log10 transformed times, 95% CI [-0.13, 0.065], p 0.42). Fewer patients on methylprednisolone (n = 10, 27.0%) required respiratory support compared to IVIG (n = 21, 55%, p 0.025). Need and duration of inotropes, intensive care unit admission, post-baseline cardiac events, major bleeding and thrombotic events were not significantly different between the study arms.

#### Conclusion

In this RCT, treatment with methylprednisolone in paediatric PIMS-TS resulted in comparable LoS compared to IVIG and might be associated with lower requirement for respiratory support. Methylprednisolone iv could be an acceptable first-line treatment for PIMS-TS, being more affordable and more widely available globally than IVIG. It has to be mentioned that the sample size was not powered to permit robust conclusions on secondary outcomes and subgroup analyses. Consolidation with the paediatric UK RECOVERY trial is planned.

#### Funding

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TW and AA contributed equally to the study. JAB and LJS contributed equally to the study

## SPN 12

### Outcome prediction in pediatric fever in neutropenia: Development of clinical decision rules and external validation of published rules based on data from the prospective multicenter SPOG 2015 FN Definition Study

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#### Background

Fever in neutropenia (FN) remains a serious complication of childhood cancer therapy. Clinical decision rules (CDRs) are recommended to help distinguish between children at high and low risk of severe infection. The aim of this analysis was to develop new CDRs for three different outcomes and to externally validate published CDRs.

#### Procedure

Children undergoing chemotherapy for cancer were observed in a prospective multicenter study (NCT02324231). CDRs predicting low from high risk infection regarding three outcomes (bacteremia, serious medical complications (SMC), safety relevant events (SRE)) were developed from multivariate regression models. SMC was defined as death due to any cause during FN, admission to an intensive care unit or severe sepsis (including septic shock). SRE was defined as bacteremia and/or SMC. Their predictive performance was assessed by internal cross-validation. Published CDRs suitable for validation were identified by literature search. Parameters of predictive performance were compared to assess reproducibility.

#### Results

In 158 patients recruited between April 2016 and August 2018, 360 FN episodes were recorded, including 56 (16%) with bacteremia, 30 (8%) with SMC and 72 (20%) with SRE. The CDRs

 

for bacteremia and SRE used four characteristics (type of malignancy, severely reduced general condition, leucocyte count <0.3 G/L, bone marrow involvement), the CDR for SMC two characteristics (severely reduced general condition and platelet count <50 G/L). Performance of all three scores was good with similar or better predictive values than published CDRs. Eleven published CDRs were externally validated. Six CDRs showed reproducibility, but only one in both sensitivity and specificity.

**Conclusions**

This analysis developed CDRs predicting bacteremia, SMC or SRE in children undergoing chemotherapy at presentation with FN. In addition, it identified six published CDRs that show some reproducibility. However, not all these six CDRs can be recommended for clinical implementation because of either a low sensitivity or lack to identify a sufficient number of patients at low risk. Validation of CDRs is fundamental to find the best balance between sensitivity and specificity, and will help to further improve management of FN.

## SPN 13

### Artificial intelligence in a pediatric emergency department: The end of misdiagnosis of pediatric fracture detection?

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**Background**

Fractures are a common reason for visits to pediatric emergency departments (EDs), and up to 9% of patients in an ED setting may experience relevant misdiagnosis of radiographs due to the need to make quick decisions in a stressful environment. While artificial intelligence (AI) tools have been developed for adult imaging, pediatric fracture detection has been relatively neglected, as it presents unique challenges such as changes in anatomy and ossification centers, growing skeletons, and subtle or even non-visible fractures (e.g., a non-displaced supracondylar fracture with joint effusion).

The aim of this study was to evaluate the accuracy of AI software for detecting fractures in the three most common fracture locations in the pediatric appendicular skeleton and to assess its potential to reduce misdiagnosis in a pediatric ED setting.

**Method**

Consecutive radiographs from patients aged 0–16 years with suspected fractures of the forearm, elbow, and lower leg were analyzed until approximately 1000 patients were reached for each anatomic location. The results of AI software BoneView (Gleamer, France) were compared to those of experienced pediatric radiologists. Each radiograph was reviewed by two radiologists, and their consensus report was used as the reference standard. Each long bone was considered a separate case.

**Results**

The study included three patient groups with frontal and lateral radiographs of the forearm (mean age of 7.9 years, range 0.5–16 years), elbow (mean age 7.7 years, range 0.5–16 years), and lower leg (mean age 4.8 years, range 0–15.5 years). The AI software BoneView demonstrated high accuracy in detecting fractures in the pediatric forearm and lower leg, with sensitivity and specificity rates of 92.2% and 92.5%, and 87.3% and 97%, respectively. In case of elbow radiographs, however, the software showed lower sensitivity and specificity rates of 82.1% and 77.6%, respectively. Across all three anatomic locations, the study found a total of 2140 fractures. Forearm studies had the highest number of fractures detected (1084), followed by lower leg radiographs (558), and elbow images (498).

**Conclusion**

These findings suggest that AI has the potential to significantly reduce misdiagnosis of pediatric fractures in an ED setting, particularly for forearm and lower leg fractures. However, improvement is needed for automated assessment of elbow radiographs before it can be implemented in clinical practice.

 

## POSTERS

### P 1

### Irritants: barriers to quality healthcare for children

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Irritants are all the little things which annoy – whilst not being serious yet when added to a stressful environment – make one reluctant to be receptive to information. The aim of this research was to identify the irritants that parents with a hospitalized child experience.

After a literature review, a survey was developed (in French), which included 2 multiple choice questions, 18 open-ended and 23 close-ended ones. The latter was based on othersurveys used in extra-hospital settings, as well as on satisfaction surveys carried out in our institution and personal experience. They were grouped into 8 themes: pre-hospital, hospital reception, hospitalization, room and equipment, "hotel's services", communication, return home, and overall perception. The study was carried out between May and September 2021. The only exclusion criteria were the refusal of the families, an end-of-life situation or not being able to communicate with the investigator. The parents answered the questionnaire orally, followed by an anonymous transcript in a database.

The study population is composed of 30 patients, of whom 53% (n = 16) were hospitalized in the department of older children and 34% (n = 10) in the infant department. The other patients (13%, n = 4) were distributed to other units. 80% of respondents described their child's hospitalization as adequate, even pleasant, with friendly and attentive staff, demonstrating overall satisfaction. The main irritants identified were, for the prehospital: the lack of space in the car park (29%), for reception at the hospital: the waiting time in the emergency room (27%), for the room and its equipment: the lack of soundproofing (33%) and the absence of a television (33%). For the "hotel" service, 52% of parents had not thought of taking objects of first necessity and would have appreciated the hospital to offer them some, as well as chargers for electronic devices, which families did not forget as much (30%).

The study carried out made it possible to identify several sources of irritants. Despite the absence of unexpected or "local" factors, the answers gathered will allow the implementation of targeted interventions to reduce irritants and strengthen collaboration between child-parents and caregivers.

### P 2

### Diagnostic delay in patients with cerebral creatine deficiency disorders

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Cerebral creatine deficiency disorders (CCDD) are caused by a defect in the enzymes L-arginine:glycine amidinotransferase (AGAT) or guanidinoacetate-N-methyltransferase (GAMT), which are involved in the synthesis of creatine; or by a mutation in the creatine transporter (CRT), which is essential for the uptake of creatine into the target cells. Creatine is an important energy source used especially in muscle and brain cells. Patients with a creatine deficiency disorder clinically present with global developmental delay with pronounced speech/ language delay, behavior abnormalities and seizures. If treatment is initiated at an early age (preferably <2 years) for the AGAT and GAMT deficiencies, affected children will benefit greatly and remain asymptomatic. Based on various studies, it is suspected that the CCDDs are largely underdiagnosed and if diagnosed, the window for effective treatment has closed.

Four patients with CCDD (2 GAMT, 2 CRT) treated at our metabolic division were initially referred to different specialists at our hospital depending on the dominating symptoms (epilepsy, speech abnormalities). A large diagnostic delay ranging from 3-27 months was observed between first referral (age range: 2.5-11 years) and final diagnosis, resulting in a likewise delayed treatment initiation. A retrospective view into the personal history of the patients revealed a severe expressive speech delay in all patients without production of any words at the age of 24 months, with additional symptoms like epilepsy and behavioral abnormalities developing later during the course of the disease.

At our center, screening for CCDD has been successfully implemented into diagnostic algorithms in the divisions of neurology and developmental pediatrics for global developmental delay, epilepsy etc., while in other specialties who may see patients at an even earlier age selective screening for these conditions is not yet completely implemented. Therefore, we suggest to define criteria based on the mode and extent of expressive speech delay that would lead to an initiation of a selective screening for CCDDs in urine. This could be initiated by pediatricians in private practice or any other specialist involved, in the hope to identify patients with the treatable AGAT and GAMT deficiencies at an earlier timepoint.

### P 3

### Bullous lesions in a 5-year-old girl – a rare presentation of a common childhood disease

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**Case report**

A healthy 5-year-old girl presented with purpura on both legs and abdominal pain to her pediatrician. Henoch Schonlein Purpura (HSP) was diagnosed. Within the next 2 weeks the purpura evolved into vesicles and bullae sizing up to 5 cm on the extremities and buttocks. Progressive abdominal pain and frequent bloody diarrhea prompted an emergency visit. Intussusception was excluded by ultrasound. Because of severe pain from the skin lesions and the abdomen the patient was admitted for i.v.-analgesia and corticosteroid treatment. Initially corticosteroids were given orally. Because of uncertain absorption due to gastrointestinal affection, therapy was soon changed to i.v. steroids. Due to increasingly painful dressing changes and smelly, slightly purulent wounds, general anaesthesia was necessary for debridement and dressing. Swabs showed growth of S. aureus. As the patient was afebrile without signs of systemic infection, no antibiotic treatment was started. Repeated debridement and high-dose steroid treatment led to rapid improvement of the skin lesions, as well as the abdominal symptoms. After hospital discharge, the patient was followed in our day clinic and showed further improvement. Corticosteroids were successfully tapered and stopped after 6 weeks. Some of the skin lesions left coin-sized scarring.

**Discussion**

HSP is the most common systemic vasculitis of infancy affecting skin, joints, GI-tract and kidneys. Bullous lesions are re-

 

ported in <2% of all HSP cases. In terms of severity, organ involvement and duration, bullous and classical HSP are comparable with most cases resolving within 4 weeks. However, up to 25% of cases of bullous HSP have sequalae with scarring or hyperpigmentation. Systemic corticosteroids may be beneficial, however clear evidence is missing.

**Conclusion**

Bullous lesions are rare manifestations of childhood PSH. Overall prognosis is comparable to classical PSH. However, scaring is common. Early high-dose corticosteroid treatment should be considered.

## P 4

### Silly Stones in Tiny Glands: a Pediatric Sialolithiasis Story

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**Background**

Pediatric sialolithiasis is a relatively uncommon condition whose exact causes are not yet well understood, but several risk factors have been identified, including genetics, environmental factors and underlying medical conditions. Stones are due to the buildup of saliva and other substances in the glands and can cause pain, swelling, and obstruction, resulting in salivary ectasia, gland dilatation and ascending infection, with a subsequent negative impact on the child's quality of life.

**Case Study**

A 4-year-old boy, with no significant past medical history presented to the ER with left submandibular swelling for three days. The day before, the family pediatrician had prescribed anti-inflammatory therapy with ibuprofen, with no benefit and subsequent enlargement of the swelling. On objective examination, a mass of tense-elastic consistency on palpation, 3 cm in length and 2 in width, roundish, partially mobilizable, was observed. The mass was located below the right mandibular ramus, 2 cm away from the mandibular angle, which is spared. Not overlying hyperemia, not painful to palpation, not warm to touch. On inspection of the oral cavity, at the sublingual caruncula level, a calcification was visible on the left side of the lingual frenulum within Wharton's duct. Three small stones of about 3 x 2 mm, very hard in consistency, were removed and an abundant yellowish-white fluid was observed leaking from Wharton's duct. The next day we performed a sonography of the submandibular gland, with Doppler finding of hypervascularization, interpretable on inflammatory phenomena. A sialolithiasis with calcinosis of the left Wharton's duct was then diagnosed. The child was discharged home and, within a week, the swelling gradually reduced until it disappeared completely.

**Conclusion**

Submandibular duct stone in a pediatric patient is rare, but should always be considered among the differential diagnoses when a patient present with a laterocervical swelling. The combination of a good medical history, plus a careful inspection of the oral cavity are of primary importance in managing this condition to prevent it from progressing and requiring more invasive treatment in the future.

## P 5

### Mental health of children and adolescents from migrant families at the Children's Hospital of Lausanne (HEL)

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**Background**

Migration can put an important psychological stress on individuals and families. The aim of this study was to assess the mental health of children and adolescents from migrant families at the Children's Hospital of Lausanne (HEL).

**Methods**

We conducted a prospective exploratory study at the Policlinic of HEL from March 2021 to December 2022. Questionnaires were filled during general pediatric consultations. We used the Strengths & Difficulties Questionnaire (SDQ) addressed to children and adolescents aged 4 to 16 years old and the World Health Organisation-Five Well-Being Index (WHO-5) was filled in by their parents. We included questions to evaluate migration trajectories and socio-demographics data.

**Results**

42 children of 33 families were included in the study, mean age was 10.6 years old. The most frequent countries of children's origins were Syria (24%), Eritrea (14%) and Turkey (14%). Ten (26%) children went through refugee camps. Violence was reported by 13 (42%) children before, during or after migration journey. Eighteen children (43%) had a provisory or no legal status in Switzerland and 8 (19%) had a raised Total Difficulties score. When looking at scales separately, 11 (26%) had a raised score on emotional problems scale, 10 (23.8%) on conduct problems scale and 9 (21%) on peer problems scale. Eleven (26%) had a lowered score on prosocial scale. A longer period in Switzerland was associated to a higher Total Difficulties score ($p = 0.001$) and a raised emotional problem score ($p = 0.0099$). Among the 30 parents who filled the WHO-5, 9 (30%) of them had a score ≤50 indicating poor wellbeing. Children whose parents had a WHO-5 score ≤50 had a raised score on emotional problems scale ($p = 0.049$). Children with provisory or no legal status, living in non-private housing and single-parent families had a higher Total Difficulties score ($p = 0.041$, $p = 0.027$ and $p = 0.018$ respectively).

**Conclusion**

We identified that migrant children with a longer stay in Switzerland, insecure legal status, single-parent families and parents with poor emotional wellbeing presented more difficulties. Although many children and adolescents with migration background show resilience, this study shows that they can be exposed to multiple health risk factors such as violence and separation but also vulnerability related to legal status and housing. A strong focus on familial and social factors is needed to better understand the complexity of their health.

 

## P 6

### A rare cause of intrauterine growth restriction, respiratory insufficiency and cytopenia: hallmarks of shwachman-diamond syndrome in the neonate

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#### Case History

A term male non-consanguineous infant was born after induced labor because of severe intrauterine growth restriction. Morphology ultrasound revealed shortened long bones. Neonatal adaptation was uncomplicated. Birth weight, body length and head circumference were all P<P3.

Physical examination showed short limbs, narrow thorax and respiratory distress. Noninvasive ventilation was started at H2 of life, followed at H4 by invasive ventilation due to respiratory insufficiency and paralytic ileus in the context of a septic shock. Chest x-ray showed short, dysplastic ribs with enlarged metaphysis and small lung volumes. Complete blood counts revealed persistent leucopenia with severe neutropenia (0.05 G/l), mild anemia and thrombocytopenia.

The suspicion of a Shwachman-Bodian-Diamond syndrome (SDS) was raised at DOL 14. Stool analysis confirmed the presence of exocrine pancreatic dysfunction. Genetic testing revealed compound heterozygous mutations SBDS gene (c.258+2T>C and c.183_184delinsCT).

Clinical course was marked by persisting respiratory insufficiency due to restrictive lung disease and potential pulmonary hypoplasia secondary to the narrow thorax. At M4 of age, he still requires noninvasive bi-level positive pressure ventilation 24h per day. Heart ultrasound showed mild pulmonary hypertension. He presents growth failure despite supplementation of pancreatic enzymes and liposoluble vitamins and increased caloric intake. He also showed persisting cytopeniae requiring 3 blood transfusions and presented 3 episodes of suspected systemic infection treated with empiric large-spectrum parenteral antibiotics.

#### Discussion

SDS (MIM#617941) is a rare autosomal recessive disease (≈1/600000 live births) mainly caused by mutations in the SDBS gene which plays an essential role in ribosome biogenesis. It is characterized by cytopeniae, exocrine pancreatic insufficiency and skeletal abnormalities. Our patient displays a severe phenotype with early onset of severe neutropenia, restrictive lung disease with respiratory failure and pulmonary hypertension.

#### Conclusion

The association of skeletal dysplasia with cytopenia, especially neutropenia, must raise suspicion of SDS. Exocrine pancreatic dysfunction should be searched and treated. Presentation with severe thoracic dysplasia, respiratory failure and severe neutropenia at birth is rare and poses therapeutical and ethical challenges due to uncertain long-term outcome with high morbidity, but also high mortality rate.

## P 7

### External male genitalia in Henoch–Schönlein purpura: systematic review

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#### Introduction

Henoch-Schönlein purpura, also called immunoglobulin A vasculitis, is the most common systemic vasculitis in children and involves the small vessels of skin, joints, kidneys, and bowel. The external male genitalia are implicated in every fifth case. Nonetheless, it is unclear which anatomical structures are involved. To address this issue, we performed a review of the literature.

#### Methods

The review was undertaken in agreement with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses. For the final analysis, we retained 85 reports published between 1972 and 2022, which reported on 114 Henoch-Schönlein cases (≤18 years, N = 104) with a penile (N = 18), a scrotal (N = 77), or both a penile and a scrotal (N = 19) involvement.

#### Results

The genital involvement mostly (N = 104) appeared concurrently with or after the skin features of Henoch-Schönlein purpura. However, it preceded the purpura in 10 cases. Patients with penile involvement (N = 37) presented with swelling (N = 26), erythema (N = 23), purpuric rash (N = 15), micturition disorders (N = 2) or priapism (N = 2). Patients with scrotal involvement (N = 96) presented with pain (N = 85), swelling (N = 79), erythema (N = 42), or scrotal purpura (N = 22). Following scrotal structures were especially often involved: scrotal skin (N = 83), epididymis (N = 49), and testes (N = 39). The scrotal skin involvement was mostly bilateral, that of epididymis and testis mostly (P<0.0001) unilateral (with a significant predilection for the left side). An ischemic testicular damage was noted in 9 cases (5 without and 4 with torsion).

#### Conclusions

Henoch–Schönlein purpura may present with a penile, a penoscrotal or a scrotal involvement. The latter can result from skin inflammation, epididymitis, orchitis, or testicular ischemia. An ischemic testicular damage may occur both with or, more frequently, without torsion.

Montorfani-Janett VML, Montorfani GE, Lavagno C, Gualco G, Bianchetti MG, Milani GP, Lava SAG, Cristallo Lacalamita M. External male genitalia in Henoch-Schönlein syndrome: a systematic review. Children (Basel) 2022;9(8):1154. doi: 10.3390/children9081154.

 

## P 8

### λ5 deficiency – newborn screening gives insight into a rare immunodeficiency

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#### Background

Since the introduction of newborn screening (NBS) using the combined quantification of T-cell receptor excision circles and kappa-deleting recombination excision circles (KREC), a number of patients have been diagnosed with λ5 deficiency, a rare autosomal-recessive form of agammaglobulinemia previously reported in only six cases. We present the largest case series to date to describe the clinical and immunological phenotype and its development over the first years of life.

#### Methods

Contacts from countries with NBS programmes using the combined screening method were approached. Data on patients with genetically confirmed λ5 deficiency were systematically collected between August and November 2022.

#### Results

Eight patients were identified with detailed data available in five children with a median follow-up of 23 months. All patients had unmeasurable or very low B-cell as well as IgM and IgA levels but normal IgG levels (maternal) in their initial investigations. IgG levels fell below the age-appropriate reference at the median age of 5 months in all patients. At least some IgA production was seen in all patients. All but one patient showed transient spikes of IgM production. CD19+ B-cell counts varied between 0 and 30 per µL of peripheral blood at 3 to 4 weeks of age, showed some increase during the follow-up period but remained low throughout the entire follow-up period. All patients remained well without relevant infections under regular immunoglobulin substitution therapy.

#### Discussion

NBS programmes that include B cell markers can identify patients with autosomal-recessive λ5 agammaglobulinemia, allowing early introduction of therapy. This case series of λ5 patients highlights the variable immunophenotype of this condition with residual B cell counts and function indicating that genetic analysis of IGLL1 should be considered also in older patients with hypogammaglobulinemia and reduced number of B cells.

## P 9

### Reliability and performance of the pediatric version of the Swiss EmergencyTriage Scale – The SETS KID 1 study

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#### Aims

The purpose of this study was to assess the reliability and the accuracy of the Swiss Emergency Triage Scale for the triage of pediatric situations.

#### Methods

This was a cross-sectional study among a convenient sample of emergency triage nurses, exposed to 16 clinical scenarios using a computerized simulator. The primary outcome was the reliability of the triage level performed by the emergency triage nurses. It was assessed by the intraclass correlation coefficient (ICC). Secondary outcomes included the accuracy of triage compared with the expert-based level (inaccurate, under, and over-triage versus accurate) and factors associated with accurate triage.

#### Results

Eighteen emergency triage nurses participated in the study and completed the evaluation of all scenarios, for a total of 288 triage decisions. The intraclass correlation coefficient was 0.84 (95%CI 0.73 – 0.93), with an agreement by scenarios from 61.1% to 100%. The accuracy was 87.2% and nurses were more likely to under-triage than to over-triage. No factor for accurate triage was identified.

#### Conclusion

This scenarios-based study showed that the Swiss Emergency Triage Scale is reliable and accurate among a pediatric population. Future research should compare it head-to-head with other international tools.

## P 10

### Collecting Data in a Network of Primary Care Pediatricians: Lessons learned from a

Collaborative Research Network in the Canton of Zurich

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To date, there has been no systematic scientific data collection in pediatric primary care in Switzerland, whose perspective is thus dramatically underrepresented in pediatric research. Establishing a nationwide network of practices participating in collaborative pediatric care research would allow us to address research questions related to the routine business of frontline pediatricians.

 

As a pilot project, we initiated a joint collaboration with over 40 pediatric practices in the Canton of Zürich in 2020 to prospectively and longitudinally collect and compare data on SARS-CoV-2 testing and clinical information on positive cases, including clinical and transmission data on SARS-CoV-2 positive children. After completion of this data collection, participating practices were asked to provide feedback on their experiences with the study in an online survey, and about their general attitudes towards participating in a future research network.

Out of all the outpatient practitioners invited, 55 signed up, and 31 (56%) collected data over a period of at least 15 weeks between the end of October 2020 and the end of July 2021. Feedback from participating (n = 20 out of 31) and non-participating practices (n = 12 out of 24), revealed that 85% of the participants found installation instructions helpful. Nevertheless, 20% encountered problems with data entry. For most participating practices (70%), receiving up-to-date feedback on the pandemic from a pediatric practice perspective was the primary motivation for participation. Approximately half of the participants (45%) expressed interest in participating in future research projects.

Based on this successful collaboration between pediatric practices in the Canton of Zurich and the University Children's Hospital Zurich, we plan to expand the existing research database and to open it to pediatric practices throughout Switzerland, thus building a national research network of pediatricians in private practice. Our results help to better tailor both database and technical support to the needs of participants in future studies.

## P 11

### Meeting language barriers in doctor-patient-communication: Interpreter assignments to children in Switzerland

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*Aim: The objective of the survey was to identify, characterise and critically appraise evidence on children acting as informal interpreters for their parents when accessing health care services in Switzerland.*

#### Background

Effective communication between displaced persons and healthcare professionals is fundamental to deliver equitable high-quality care. From an ethical and legal point of view, interpretation by minors, family members or acquaintances are not acceptable. Especially children may not have sufficient language proficiency (in either language) to act as interpreters.

#### Methods

We designed an anonymous, self-administered questionnaire on interpreter assignment for teenagers >12 years of age. Secondary schools in German-speaking suburban regions in Switzerland were requested to perform the survey in their classes between August and December 2021. Response rate was very low due to non-cooperation of local school authorities. From a total of 230 participants, 105 met inclusion criteria (teenagers from migrant families with language barrier). The demographic profiles and experience as or with an interpreter during healthcare encounters were assessed. Outcomes included frequency of, setting and modality of interpreter assignment. We stratified the data by mother and father as well as by child interpreter (defined as <10 years of age) and teenage interpreters. We descriptively analysed the sample characteristics and responses.

#### Results

Data from 105 participants were reviewed, all were between 12 and 17 years of age with equal gender distribution. (Semi-) Professional interpreter use was poor across all areas (3% for mothers and 5% for fathers). Child interpreter assignment was found to occur in 20% (for mothers) and 14% (for fathers), teenage interpreter in 25% and 17%, respectively. Spouses were reported to act as interpreters in 28.6%. Notably, 55 case reports involved siblings as interpreters. Common setting was outpatient visit to general practitioner, followed by paediatrician and "hospital visit". Only about 35% declared to have no experience with intercultural communication, most of their parents were bi- or multilingual (72%). The main limitation is recall bias.

#### Conclusion

There is evidence that the number of interpreter assignments to minor family members has been underestimated, suggesting a high estimated number of unreported cases by healthcare providers and signalling an alarming disparity between patient perception and provider behaviour.

## P 12

### Fluids and body composition during anesthesia in children: a bioimpedance study

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#### Background

The assessment of body composition, total body fluid volume, intracellular volume and extracellular volume before and after anesthesia may be useful to define a better intraoperative fluid administration.

#### Methods

A whole body bioimpedance spectroscopy device (BCM, Fresenius Medical Care, Germany) was used to measure total body fluid volume, extracellular volume, intracellular volume and fluid overload or deficit. BCM-measurements were performed before and after general anesthesia in 100 unselected healthy (ASA ≤2) children and adolescents aged 0-16 years visiting the Pediatric Institute of Southern Switzerland for low-risk surgical procedures.

#### Results

In 100 children and adolescents aged 7.0 [4.8 – 11] years (median and interquartile range), the average total body water (TBW) increased perioperatively with a delta value of 182 [0 – 383] mL/m2 from pre- to postoperatively, as well as the extracellular water content (ECW), which had an equivalent increase with a delta value of 169 [19 – 307] mL/m2. The changes in TBW ($r2 = 0.05$, $p = 0.02$) and ECW ($r2 = 0.20$, $p<0.0001$) correlates with the amount of fluids administered.

#### Conclusions

Routine intraoperative fluid administration results in a significant fluid accumulation in low-risk schoolchildren during general anesthesia. Children and adolescents without major health problems (ASA ≤2) undergoing short procedures (<1 hour), do not need any perioperative intravenous fluid therapy, because they are allowed to take clear fluids up to 1 h prior anaesthesia. BCM-measurements yielded plausible results in children and adolescents undergoing general anesthesia and could become useful for guiding intraoperative fluid therapy in future studies.

 

P 13

## Nitrous oxide inhalation administered by a medical assistant is a safe and effective way to facilitate procedures in an ambulatory paediatric ward.

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### Background

Managing pain and distress in children undergoing procedural pain is a priority in the pediatric care. The MEOPA (50% nitrous oxide to 50% oxygen) is widely used to alleviate anxiety or pain during care procedures in various medical domains. This pharmacological intervention is safe to administer in children before performing a painful procedure to reduce pain and anxiety. Administration by non-anesthesiologist personnel trained in the use of MEOPA is widespread throughout the world, however, its use is still too often reserved for doctors or nurses and not enough for other health professionals. A consideration on the possibility of MEOPA administration by medical assistants has been implemented to improve the management of pain and anxiety in paediatric consultations. The purpose of this study is to describe the experience of MEOPA supplied by medical assistants and the safety use during the performance of painful procedures in paediatric ambulatory care.

### Method

A retrospective study was conducted in the paediatric outpatient clinic of a regional hospital in Switzerland and included clinical and surgical consultations.

### Results

The MEOPA was administered in 324 children, ages 3 to 19 years (mean 10.4). Inhalation time ranged from 4 to 50 minutes (mean 9.6). In more than half of the cases, the administration of MEOPA was combined with one or two other analgesics and/or local anaesthetics. Only 6 mild adverse events (vomiting, agitation, pain) were observed and MEOPA was discontinued. No respiratory and/or cardiovascular problems have been noted. Most patients (98%) were calm and relaxed without adverse events. The use of MEOPA was considered very successful by the entire healthcare team and the parents.

### Conclusion

This study confirms that the use of MEOPA in the outpatient setting by trained medical assistants is safe, feasible and effective. The supply of MEOPA for minor procedures in children by medical assistants for minor procedures in the paediatric outpatient department has enhanced the pain control with great satisfaction from patients, parents and health professionals.

P 14

## Effective educational videos with the method of storytelling for reducing topical corticosteroid fear in parents of children with atopic dermatitis

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### Objectives

Education is a central strategy to improve treatment adherence and disease outcomes in children with atopic dermatitis (AD). The method of storytelling uses stories to transmit and share information, knowledge, and experiences. In this two-armed randomized controlled trial, we aimed to investigate the efficacy of educational videos based on the method of storytelling in parents with children, aged 0 to 5 years, affected by AD.

### Methods

The primary outcome measures were parental fear of topical corticosteroids (TCS) based on the "Topical Cortcosteroid Phobia Score" (TOPICOP) and quality of life assessed with the "Family Dermatology Life Quality Index" (FDLQI). Disease severity evaluated by "Scoring atopic dermatitis" (SCORAD) served as secondary outcome measure. Study assessments were performed at baseline (T1), 1-4 weeks later (T2) and at 3-month-follow-up (T3). Parents in the intervention group were exposed to the videos between baseline and T2.

### Results

Forty patients were recruited, 21 in the intervention and 19 in the control groups, respectively. A statistically significant reduction in parental fear of TCS was found in the intervention group as compared to controls at T2 after video education ($p < 0.0001$), that was maintained at T3 ($p = .001$). No differences in FDLQI and SCORAD were found between the two groups at any point.

### Discussion

Our findings show that video education with the method of storytelling is effective in reducing TCS fear. The mix of multidisciplinary evidence-based facts and true patient stories, relevant content, and tailored information in a non-clinical setting make the videos authentic and successful. While we did not find an impact on disease severity and quality of life, effectively reducing TCS fear remains an important part for AD management. We believe that the use of these videos is highly beneficial for the management of children with AD and should increasingly be implemented in practice.

 

## P 16

### Perceptions et répercussions de la crise du Covid-19 sur les familles requérantes d'asile à Genève

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**Objectifs**

La pandémie de la Covid-19 a eu de nombreuses répercussions sur les populations. Au travers de cette étude, nous cherchons à comprendre quelles sont les connaissances concernant le virus Sars-CoV2 ainsi que son impact dans la population migrante pédiatrique de Genève et leur famille. Nous étudierons également les répercussions sur l'accès aux soins et les difficultés perçues par les familles pendant cette période.

**Méthodes**

Nous avons recruté 28 familles suivies à la consultation pédiatrique santé-migrants des hôpitaux universitaires de Genève et leurs avons fait passer un questionnaire en fin de consultation. Nous avons inclus uniquement les familles qui étaient arrivées à Genève au plus tard en janvier 2020.

**Résultats**

Nos résultats montrent que seulement 11% de la population interrogée a renoncé à des soins à cause de la pandémie du Covid-19. 63% des parents questionnés ne se sont pas sentis plus isolés que d'habitude pendant cette période de crise. 50% des parents ont rencontré des difficultés à s'occuper de leurs enfants pendant la fermeture de l'école et 2/3 n'ont pas réussi à les aider avec l'école à la maison. 78% des enfants et des parents ont bien compris comment le virus se transmet, 96% des enfants et 94% des parents recrutés connaissent les gestes de protection.

**Conclusion**

Cette étude met en évidence la fonction centrale de l'école dans la vie des familles interrogées, tant dans l'apprentissage, dans l'occupation du temps, que dans l'aide apportée aux parents dans l'éducation. Nous avons également découvert que la majorité des enfants et des parents questionnés avaient une bonne compréhension de la situation, quels étaient les risques et comment s'en protéger. Cependant, les enfants avaient une meilleure connaissance que leurs parents. Enfin, nous avons constaté que la population migrante souvent décrite comme stigmatisée n'avait pas renoncé à des soins pendant la pandémie.

## P 17

### Unterated congenital hypothyroidism

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**Initial presentation**

A 6-month-old infant from Albania comes to the emergency room presenting hypotonia, a development delay and feeding difficulties worsening since her 4 months. In her medical history, she only had neonatal jaundice with a couple days of phototherapy.

On physical examination, she presents a bradycardia, a severe axial and peripheral hypotonia, macroglossia, a wide opened anterior and posterior fontanel, an umbilical hernia and several brownish macular skin lesions. Her weight is below the third percentile. The blood tests show macrocytic anemia at 79g/L, altered thyroid function with undetectable T3, T4 and a TSH at 449mUI/L. A screening for malformations shows no organ abnormalities but reveals a nephrocalcinosis with bilateral macrolithiasis. The bone age assessment shows the age of a newborn. The thyroid scintigraphy exposes a complete block of iodine organification. The thyroid gland is orthotopic.

**Evolution**

Given the typical clinical presentation, the diagnosis of non-treated congenital hypothyroidism is established. A hormone replacement therapy is started. After a few days of treatment, the first effects are noticed by an increase of heart rate.

On the developmental aspect, we see an improvement on the peripheral tonus starting from the 7th day of treatment. Later on, some smiles appear, a better contact with longer awakening moments and horizontal movements of the head become possible. The axial tonus and the capacity to hold the head are still not acquired after 2 months of treatment.

On the growth aspect, the infant has a severe malnutrition caused by a lack of intake due to multiple causes such as asthenia, hypotonia and macroglossia. Her active food intake increases gradually from 50 to 140 cc/kg/day. With the help of a supplemented diet and a nasogastric tube for 35 days, the weight gain is of 18 g/day for 2 months. The regular measures of cranial circumference show a marked increase with a change in facial appearance and a gradual decrease of macroglossia at the same time.

The consequences of no treatment up to 6 months of life and the recovery capacity remain unsure, especially for brain damage.

**Conclusion**

The specificity of this infant's case is the rare situation of no diagnosis of hypothyroidism for 6 months, showing us indirectly the thyroid hormone's effects on the body.

This situation leads to the issue of the newborn screening, which is not an issue in Switzerland but still is for a lot of countries.

## P 18

### An uncommon cause of hypoglycemia

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**Case report**

A 13months old girl presented to the hospital after falling on her head from her height, without any loss of consciousness. She was asymptomatic apart from sleepiness that persisted over the per-protocol 6h surveillance. This prompted further investigations that showed non-ketotic hypoglycemia of 1.6mM, despite her feeding during the surveillance. She was started on IV glucosaline.

Her past medical history and family history were unremarkable. She was born at term with macrosomia (no gestational diabetes). Guthrie screening was normal. Her development and growth were normal as well. The toxic screening returned negative; the electrolytes, liver and renal functions were normal. Cortisol (578 nmol/L), IGF-1 (6.3 nmol/l), thyroid function, and acylcarnitine profile were within normal limits. Insulin (14.7 mU/L) and C-peptide (871 pmol/L) levels were elevated, considering she was in hypoglycemia, while GH was low (4.19 ug/l). She had other episodes of hypoglycemia, requiring a further increase of the glucose infusion rate to 8mg/kg/min. During a hypoglycemia (2.7mM), we administered 1mg glucagon which increased the glycemia to 6.4mM (positive glucagon test), showing adequate glucose mobilization from the liver. A brain MRI showed a slightly smaller than normal pituitary gland. Genetic analysis found none of the mutations currently associated with

 

congenital hyperinsulinism (e.g. ABCC8, KCNJ11, GCK, HNF1A, HNF4A, HADH, HK1). Growth hormone deficiency was not formally ruled out.

Diazoxide (insulin secretion inhibitor) was introduced, allowing complete weaning of the glucose supplementation. We added hydrochlorothiazide to prevent hypervolemia. She was equipped with a continuous glucose monitor and discharged.

**Discussion**

The absence of ketosis upon hypoglycemia can be caused by defective fatty acid oxidation or defective ketogenesis. In both cases, patient should not develop hypoglycemia if not fasting. Non-ketotic hypoglycemia can also be caused by excess insulin, whether congenital hyperinsulinism (1:50'000; 70-90% diagnosed during the 1st year), exogenous, from an insulinoma or yet associated with a syndrome or panhypopituitarism.

**Conclusion**

When caring for a child with an altered mental state, glucose measurement should be part of the initial evaluation. If hypoglycemia ensues, ketonemia determination is critical. Outside of the neonatal period, the differential diagnosis of non-ketotic hypoglycemia is narrow and should prompt endocrinologist referral.

## P 19

### Recurrent Seizures in two Children with new Onset of Hypoparathyroidism

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**Introduction**

Hypocalcaemia is a treatable cause of seizures. Various pathological conditions may promote hypocalcemia, including the lack of parathyroid hormone (PTH).

Tight regulation of calcium homeostasis is promoted by two calciotropic hormones: PTH and 1,25-dihydroxyvitamin D (1,25(OH)2D). PTH is released from the parathyroid gland in response to low serum calcium and facilitates mobilization of calcium from the bone as well as synthesis of 1,25(OH)2D in the kidneys and, hence, increases calcium-absorption. Consequently, a lack of PTH leads to hypocalcaemia. Herein, we report on two children with hypoparathyroidism with initial presentation of seizures.

**Case series**

Between 2021 and 2023 two children presented with recurrent seizures in our clinic. Patient 1 was a 7-year-old girl, Patient 2 was an 8-year-old girl. Their past medical history was unremarkable, but detailed questioning revealed episodes of tetany, paresthesia, and muscle cramps. Positive Chvostek sign was found in both. Blood gas analysis revealed low ionized calcium levels, leading to a tentative diagnosis of provoked seizures due to hypocalcemia. Blood tests showed unmeasurable PTH levels, low total and ionized serum calcium, as well as elevated phosphate levels. Plasma 25-dydroxyvitamin D (25-OHD) levels were normal, accompanied by low 1,25(OH)2D-levels in both cases.

Since starting calcium and calcitriol replacement, both patients recovered well and have been seizure-free.

Genetic analysis was conducted. In Patient 1, a compound heterozygous mutation in the AIRE-gene was found. Results for Patient 2 are currently pending.

**Discussion**

If hypocalcaemia is suspected, a detailed medical history should be obtained, and clinical signs should be actively looked for. Blood gas analysis confirms the diagnosis.

Hypoparathyroidism in children is rare, and the differential diagnosis includes iatrogenic, hereditary, syndromal, and autoimmune forms. Patient 1 showed a heterozygous mutation in the AIRE-gene, which is known to cause the autoimmune polyendocrine syndrome type 1, a syndrome characterized by candidiasis in early childhood as well as hypoparathyroidism in school-aged children and Addison's disease in youth.

**Conclusion**

Hypoparathyroidism and, consequently hypocalcaemia are rare, treatable causes of seizures. Treatment includes calcium and calcitriol replacement. Genetic testing helps confirm the underlying cause of hypoparathyroidism and can be relevant for further follow-up.

## P 20

### Think about vitamin D deficiency rickets in child refugee with a short stature.

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**Intro**

Rickets is a childhood disease caused by a lack of mineralization in the growth plate and osteoid matrix. It is mainly due to deficient intake of vitamin D and calcium or metabolic issues. The disease is most common in children aged 6-23 months and is rare in developed countries, it affects 2% of migrant populations in Switzerland, especially those from the Middle East. Rickets manifests itself in specific bone features, with severe cases leading to bone deformities and growth retardation.

**Case**

A 22-month-old Syrian boy presented with short stature after becoming a refugee in Switzerland. He had a birth weight of 2 kg and was exclusively breastfed with occasional diversification. On admission, his weight was 8.3 kg (<p3), height 74 cm (<p3), head circumference 49 cm (p40), and BMI of 15.16 kg/m2 (p9). The clinical examination revealed a tibial bone deformity, swelling of the wrists and ankles, a 'rachitic rosary', and a waddling gait. Blood test showed hypophosphatemia at 0.5 mM, calcemia 2.1 mM, alkaline phosphatase 707 U/L, an increased PTH level of 49pmol/L,, and a decreased vitamin D 25-OH level at 8 µM. The radiological assessment found osteoporosis and rachitic changes. The child was treated with vitamin D supplementation and calcium.

**Discussion**

Rickets, a disease first described in the 17th century, reappeared in recent decades due to multiple factors and has been reported even in children in Western countries. Diagnosis is established by clinical, biochemical, and radiographic criteria. To prevent rickets, systematic vitamin D supplementation for infants for 3 years is recommended in Switzerland. Vitamin D supplementation is necessary in infants and children who manifest clinical features of rickets. Hypocalcemia should be treated with calcium supplements. In developing countries with poor resources and particularly those with civil war, the disease is probably increasing. This case highlights the consequences of exclusive breastfeeding without significant diversification and absence of vitamin D substitution. The child was successfully treated with oral supplementation with calcium and vitamin D, and dietary changes. Childhood check-ups with growth and development screenings are crucial for early detection.

 

**Ccl**

Vitamin D deficiency rickets is a concern for breastfed refugee children without vitamin D supplementation and those with darker skin. Current guidelines recommend vitamin D supplementation from birth for 3 years to prevent rickets.

**P 21**

## Where is the magnet ball?

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### Background

In recent years, the number of reported ingestions and aspirations of neodymium magnets in children increased. As the ingestion of multiple magnets can lead to intestinal obstruction or perforation morbidity is high. Most injuries caused by swallowed magnets are ingestions, however magnetic foreign bodies are also seen in the respiratory tract. We present a case of a child who swallowed 22 magnets, of which 21 were ingested and 1 was aspirated.

### Case

A 10-year-old boy was presented in our emergency department. He told his mother that he had swallowed 2 magnetic beads 3 hours earlier. The patient reported pain in the throat. Furthermore, immediately after the incident he experienced dyspnoea for a few seconds. Otherwise, he was asymptomatic. The patient had an anxiety disorder and was treated with fluoxetine. There was no other significant family/social/past medical history. The patient was in good condition with normal vital signs and no signs of respiratory distress. Besides pain on palpation in the right lower abdomen, there were no other findings on physical examination. We took a radiograph from mouth to rectum. This showed 21 round foreign bodies, 2 of which were joined together and projected on the mid of the oesophagus, 2 others on the left upper abdominal quadrant and 17 on the right lower abdominal quadrant. Afterwards the patient confessed to having swallowed more magnets 4 days ago. We decided to remove the magnets by gastroscopy and laparotomy. The gastroscopy showed only 1 magnet in the middle oesophagus. We then assumed that the patient must have aspirated the other magnet. Finally, both magnetic beads were retrieved, first by bronchoscopy followed by gastroscopy. At the subsequent laparotomy, an ileo-colonic fistula with perforation was found containing 17 magnet beads. 2 beads were found in the jejunum with intact bowel. We were able to remove all magnets and to close the fistula without any complications. The patient was discharged from our hospital on day 6 in a good condition.

### Conclusion

This case shows that it is essential to take a radiograph from mouth to rectum, as the history is not always reliable. Although most swallowed foreign bodies are located in the gastrointestinal tract, one must always consider an aspiration. We should have considered an aspiration earlier as the localisation of the upper 2 magnets (mid oesophagus) was suspicious. A lateral x-ray may have been beneficial.

**P 22**

## Acute onset of intestinal failure in a 6 weeks old boy: early manifestation of autoimmune enteropathy due to STAT-3 Gain of Function Mutations

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### Introduction

STAT-3 gain-of-function (GOF) mutations cause early onset autoimmune disease, immunodeficiency and lymphoproliferation. Typical clinical manifestations are growth failure, susceptibility to respiratory infections, autoimmune enteropathy, interstitial lung disease, diabetes, cytopenia, hypogammaglobulinemia or lymphoproliferation. STAT-3 GOF Mutations present rarely in early infancy and therefore, data regarding clinical outcomes and treatment options are very limited.

We report the case of a previously healthy boy, who was presented at the age of 6 weeks with acute watery diarrhea. The boy was born at term to unrelated parents with an unremarkable family history. Initially, sepsis was suspected, but no pathogen was detected. Antimicrobial treatment and bowel rest led to clinical improvement, however intestinal failure and dependency on parenteral nutrition (PN) continued. The endoscopy showed villous blunting, loss of goblet cells, expansion of the lamina propria, mild neutrophilic cryptitis as well as increased crypt apoptosis. In addition, the autoimmune enteropathy associated 75kDa antigen was significantly elevated. Genetic testing revealed heterozygotic de novo STAT3 gain of function mutations (STAT3 c.2144C>T p.(Pro715Leu), rs1064794957).

Immunosuppressive treatment was started with Methylprednisolone, subsequently Tacrolimus was added due to insufficient response. However, recurrent episodes of acute watery diarrhea with rapid dehydrations occured. Very high caloric intake was necessary to maintain weight gain and growth along the 3rd percentile, suggesting ongoing intestinal malabsorption. After confirmation of active disease on endoscopy, Ruxolitinib was started at the age of 14 months as single therapy. So far, the boy tolerates Ruxolitinib very well, without significant side effects. Despite spontaneous reduction of his oral intake to an age appropriate level, his weight and growth improved to the 10th percentile. At the current age of 18 months, he is clinically well without severe infections or any other typical symptoms of STAT-3 GOF mutations.

### Conclusion

This case with its very early onset of autoimmune enteropathy illustrates the wide clinical spectrum of STAT-3 GOF Mutations. In the short term, Ruxolitinib showed a good response without significant side effects. As the prognosis remains uncertain, other treatment options such stem cell transplantation are currently considered.

 

## P 23

### Progressive lordosis leading to superior mesenteric artery syndrome

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#### Introduction

Superior Mesenteric Artery Syndrome (SMAS) is a rare form of acute or chronic proximal intestinal obstruction, due to the compression of the third duodenum between the aorta and the superior mesenteric artery. Symptoms are non specific and have overlap with more common gastrointestinal disorders, therefore diagnostic delay is common.

#### Case report

17-year-old male with genetic spastic quadriplegia followed for enteral nutritional support and constipation. He first presented with 2-3 months of daily nausea, vomiting, post-prandial and nocturnal epigastric discomfort and progressively decreasing in nocturnal feeding tolerance. We noted a weight loss of 2.6 kg in 4 months. The symptoms worsened with onset of bilious vomiting episodes, severe pain and reduced general condition. On the orthopedic side, a severe lordosis was progressive over years, pushing the abdominal contents forward and resulting in the palpation of a pulsatile mass (aorta) in the abdomen. Suspicion of SMAS was confirmed with an upper gastro-intestinal series showing a dilated proximal duodenum, a transition point at the third part of the duodenum at the level of L1 body, antiperistaltic waves just proximal to the obstruction and a delayed gastric emptying. No other relevant information emerged from the CT arteriography. In order to feed him, an attempt to place a gastrojejunostomy tube failed, leading to a nosocomial complication of Klebsiella Pneumoniae sepsis on bacterial translocation which responded well to IV antibiotics and nasogastric tube on aspiration. As we had to stop enteral feeding, we started a total parenteral nutrition with a PICC-line. He stayed a total of 23 days in the hospital and is now discharged with home parenteral nutrition and progressive weight gain is seen. Our goal is for him to return to his original weight (+5kg) before trying an enteral gastric feeding again. Due to his anatomy and the progressive lordosis, it is possible that surgical intervention of SMAS will be required.

#### Conclusion

The SMAS should be raised even in front of non specific gastrointestinal symptoms, in particular when anatomical deformation and/or weight loss is associated with difficult enteral feeding. The upper GI series seems to be a relevant first exam to start the investigations. Studies show that 80% of patients respond to medical treatment to restore the retroperitoneal fat. A surgical intervention should be discussed in case of absence of improvement after 6 weeks.

## P 24

### Clinical manifestations of MS alpha 1 antitrypsine phenotype

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#### Background

Common alpha 1 antitrypsine (AAT) alleles are referred to as M, S and Z, the normal phenotype being homozygote MM. AAT deficit is found in carriers of alleles ZZ, causing pulmonary and liver affections. The most common deficiency variant is the S one. The heterozygote MS phenotype (PiMS) is part of the mild deficit manifestations. Reports showed that patients with PiMS are at greater risk of impaired pulmonary function. At the time, little is known about the impact of PiMS on the liver. Methods: All patients with MS AAT phenotype diagnosed between November 2018 and June 2022 were included. Clinical, biological and imaging data were collected at presentation and during follow-up. In our center, AAT phenotype is analyzed per protocol for neonatal cholestasis, unexplained liver test abnormalities or gallbladder lithiasis.

#### Results

8 patients with PiMS were reported. Gender was equally represented. 3/8 patients were born premature. Age at diagnosis ranges from 1 month to 13 years, with a mean of 2.5 years. The initial presentation was asymptomatic for 3/8 patients, 1/8 complained of abdominal pain and vomiting and 4/8 had neonatal icterus, including one with associated acholic stools. No hepatosplenomegaly neither signs of chronic liver disease were observed in all patients at diagnosis nor during follow-up. At diagnosis 6/8 patients presented with liver tests abnormalities. Among the 4 icteric patients, 3 had neonatal cholestasis with a mean conjugated bilirubin of 21.3 umol/l. 5/8 patients had elevated liver alanine transaminase with a mean value of 685 U/l. 2/8 patient had both cholestasis and cytolysis. 3/8 patients had gallbladder lithiasis without complication. 3/8 patients had comorbidities that could have participated to liver test abnormalities: one patient had a porto-systemic shunt with spontaneous closure during follow-up, another had hypothyroidism and there was one CMV primary infection at diagnosis. Over time, patients benefited from 1 to 4 follow-up consults, with a mean follow-up time of 11.25 months. During follow-up, 3/8 still had asymptomatic liver tests abnormalities and 1/8 still had asymptomatic gallbladder lithiasis with normal liver tests. Conclusion: PiMS can be associated with neonatal cholestasis, persistent liver test abnormalities and gallbladder lithiasis. To evaluate further complications, a specialized follow-up by a pediatric gastroenterologist is recommended.

 

## P 25

### Chronic recurrent multifocal osteomyelis: a case report

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Chronic recurrent multifocal osteomyelitis (CRMO) is a rare autoimmune inflammatory condition affecting children and young adults. The manifestation is unspecific, the patients or parents often report recurrent severe bone pain at multiple sites, swelling or warmth in the point of tenderness. The imaging may often suggest an infectious osteomyelitis or malignancy. Thus, this condition is a diagnosis of exclusion.

We had a 9 years old female patient with a story of acute pain in the right clavicle and swelling in regard for a few days, with a story of right paralombar and right hip intermittent pain for more than 4 months. After multiple consultations in different hospitals without any diagnosis, X Rays showing a lytic lesion in the clavicle and laboratory study not relevant for an infectious or malignant cause, a clavicle dedicated MRI is performed. A malignant process is excluded and radiologically there are signs of osteomyelitis but no general condition compatible with an invasive bacterial infection. This makes consider a total body MRI. Result is multiple inflammatory edematous bony lesions, consistent with CRMO (L3, right sacral fin and iliac wing, right anterosuperior iliac spine, right femoral greater trochanter, distal metaphysis of the left tibia, right third metatarsal, right clavicle). Diagnosis of CRMO is made. A treatment of NSAID is started. Ten days later, the pains are stable and due presence of vertebral lesions, a TNF-inhibitor is added to the treatment of NSAID.

Multiple, atypical location bony lesions compatible with osteomyelitis associated with non septic child should suggest CRMO. Total body MRI is the gold standard imaging modality for diagnosis. The basis of treatment is based on anti-inflammatory drugs. If the axial skeleton is affected, treatment with TNF-inhibitors should be considered in partnership with the pediatric rhumatologist. Correct diagnosis can be delayed resulting in chronic pain, decreased physical activity, school absenteeism and certain orthopedic complications such as vertebral compression or growth disturbance.

Such a clinical presentation should lead the pediatrician to address the patient to a pediatric orthopedic consultation.

## P 26

### A case of neonatal HHV-6 myocarditis- the role of diagnostic work up

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**Introduction**

Acute left heart failure in neonatal period may be associated with sepsis, myocarditis, or genetic cardiomyopathy. Myocarditis is an inflammatory heart disease caused by various pathogens. Endomyocardbiopsy (EMB) provides an important information for further decision-making.

**Case report**

A 15 -day old girl born at term presented in cold shock with severe mixed metabolic – respiratory acidosis. She was intubated and put on circulatory support with Milrinon and Noradrenalin. Empirical antibiotics were started. Rapid stabilization could be achieved, and support weaned off within 48 hours. In the course bacterial as well as metabolic etiology for shock were excluded. Only HHV 6 PCR was positive in liquor and blood and she was started on Ganciclovir. Transthoracic echocardiography on day 3 showed normal biventricular function and a medium-sized perimembranous ventricular septal defect (VSD). Despite clinical improvement, she remained tachypneic and showed poor feeding, which prompted a reevaluation. Increasing cardiac marker were noted as well as a reduced biventricular cardiac function on echo. She was transferred to a tertiary center for further diagnostic work up. Medical heart failure treatment was intensified and a diagnostic cardiac catheterization with EMB was performed. Unfortunately, during EMB a pericardial tamponade due to myocardial perforation occurred with need for surgical closure, resuscitation, short-term extracorporal membrane oxygenation and with intercurrent pulmonary banding (PAB) performed. Overall, the patient recovered well under anti-congestive heart failure medication and is planned for VSD closure and PAB debanding. The EMB demonstrated healed myocarditis with HHV6 B and no evidence for eosinophil or giant cell myocarditis, neither a dilatative cardiomyopathy.

**Discussion**

Myocarditis/Cardiomyopathy in neonates is rather uncommon but with a wide range of differential diagnosis hence a comprehensive work up is necessary. EMB is an important investigation tool to complete diagnosis in children with suspected myocarditis and provides important information such as type and stage of myocarditis for further clinical management. Although the risk for myocard perforation during biopsy is low, it should not be underestimated.

**Conclusion**

Diagnosing myocarditis in neonates is challenging. In our case EMB played an important role for diagnosis und understanding initial clinical presentation.

## P 27

### Large Umbilical Venous Catheter-Associated Intracardiac Infected Thrombosis in Preterm Infant

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**Background**

Central venous catheters are routinely used in critically ill and preterm neonates for application of medication and parenteral nutrition. Catheter related thrombosis is a serious complication with high morbidity, especially in neonates with low birth weight (<1250 g), with reported incidences between 0.7% to 67%. Risk factors for thrombosis in preterm infants include low birth weight (small for gestational age), elevated haematocrit (>55%) and maternal preeclampsia.

**Case Presentation**

We present a premature boy, born at 30+1 weeks of gestation, birth weight 1190g. He needed resuscitation, with respiratory support by CPAP and an umbilical vein catheter was placed. At day 5 after birth, he presented in bad clinical condition, and after blood culture sampling antibiotical treatment was started (amoxicillin, amikacin). Blood cultures showed Staph. aureus sepsis, with positive cultures also in umbilical vein catheter tip and in liquor. Due to a swollen and red right toe, septical embolism was suspected and echocardiography on day 12 after birth showed an inhomogen massive structure (1 x 1 cm) in the right

 

atrium attached to the atrial septum. An infected thrombus or an endocarditis were suspected. Surgical treatment was discussed but not possible due to low body weight and necessity of heart lung machine for the procedure. Therefore, antibiotic therapy was changed to an endocarditis regime (rifampicin, flucloxacillin, gentamicin), and anticoagulation with low-molecular heparin. Over the next weeks, the boy's clinical status improved, and respiratory support could be stopped at day 17. First negative blood culture was seen at day 4 after change of antibiotic treatment. Echocardiographic follow-up showed thrombus dissolve till week 5. Antibiotic therapy was stopped 6 weeks after first negative blood culture. Repetitive cranial ultrasounds showed periventricular leukomalacia with cystic parenchymal defects, confirmed by MRI 6 weeks after birth. The finding was diffusely bilateral and therefore not compatible with septic embolism.

**Conclusion**

Central venous catheters in preterm infants bare the risk of thrombosis with secondary infection, presenting like endocarditis. In cases of unsuccessful antibiotic therapy despite therapy according resistogram, infected thrombosis should be considered. As surgical options are limited in very low birth weight infants, combination therapy with antibiotics and anticoagulation are suggested with promising results.

## P 28

### SVT in infants, with one picked-up by a Smart Device. A Report of two cases

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Supraventricular tachycardia (SVT) is the most common cause of arrhythmia in children, occurring mostly in otherwise healthy patients. Its estimated prevalence is 0.1 to 0.4% in the paediatric population, and diagnosis can be challenging in the very young.

We report 2 cases of SVT in an infant and a newborn, respectively.

Case 1 is a 48-day-old infant diagnosed antenatally with arrhythmia (i.e. irregular auricular rhythm up to 400-500/min, irregular ventricular rhythm and foetal tachycardia up to 220-240/min), without any heart defect. Patient was delivered vaginally and adapted well. EKG performed in early postnatal days revealed intermittent supraventricular extrasystoles, with no other abnormalities. Echocardiography (ECHO) was not repeated at this point. At 48 days of life, the baby was brought to our emergency department (ED) for tachycardia at 250/min, revealed by a special baby sock able to measure heart rhythm (mother's choice). There were no signs of shock, no respiratory distress, no fever. SVT was confirmed on EKG (HR at 264/min), with vagal manoeuvre leading to sinus rhythm resumption. ECHO performed later was unremarkable. A final diagnosis of SVT from extra cardiac bundle was retained and beta-blocker therapy started.

Case 2 is a 2-week-old term neonate, born vaginally following prolonged untreated rupture of membranes who presented to our ED with mild afebrile rhinitis, respiratory distress and livedo. The baby had signs of compensated shock with tachycardia (HR 230-250/min), normal arterial blood pressure (102/69mmHg), normal capillary refill time and no signs of right heart failure. Blood gases showed mixed acidosis, with bilateral pulmonary infiltrates on chest X-ray. The initial diagnosis considered being pulmonary sepsis, IV antibiotics were started. Then, EKG was performed and revealed SVT that prompted unsuccessful vagal manoeuvres, sinus rhythm recovered only after administration of 2 doses of IV Adenosine®. The child was transferred to ICU for non-invasive ventilation that was rapidly be discontinued. Antibiotics were stopped 48 hours later, as blood exams results were unremarkable. Control EKG and ECHO performed later did not show abnormalities. The child could be discharged on beta-blockers with a final diagnosis of SVT from cardiac bundle immaturity.

Although common in neonates and infants, SVT presentation can be tricky. Our 1st case was depicted by a smart device installed by the mother. Utility of such device is matter of debate.

## P 29

### Neonatal post-traumatic hyphema: a case report

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**Introduction**

Ocular traumatisms related to childbirth are rare and often subordinate to maneuvers with instruments. A variety of complications have been described involving anterior and posterior segment of the eye due to obstetric traumatism. Minor ocular trauma is common and not significant. Serious ocular injuries occur in 0.2% of cases. They include rupture of Desmet's corner membranes, laceration and palpebral hematoma, hyphema, vitreous hemorrhage and corneal edema. Traumatic hyphema is a bloody effusion of the anterior chamber of the eye and require evaluation and treatment by an ophthalmologist.

**Methods**

We report a case of right-side eye hyphema diagnosed in the following hours after birth in a term newborn. The birth was done by emergency cesarean for presentation defect. Extraction during cesarean was difficult.

**Results**

The patient was evaluated by an ophthalmologist for the first time at the age of 2 days. The intraocular pressure (IOP) was 3 mmHg in the right eye. The right eye showed a blood clot with fibrin in the anterior chamber and clearly dilated iris vessels accompanied by conjunctival hyperemia. The cornea appeared regular without Descemet's folds. An ophthalmologic ultrasound was performed, revealing an adherent retina and no evidence of mass. Prednisolone eye drops were prescribed as an initial treatment.

A check-up was conducted 3 days later; IOP was 9 mmHg in the right eye. The conjunctiva and cornea were clear. The fibrin in the pupillary axis was clearly less visible. In the pupil plane, no more blood coagulation was observed. The iris vessels were still prominently dilated. Considering the favorable evolution, Prednisolone dosage was not increased.

A third follow-up took place 1 week after. IOP was stable with a measured value of 10 mmHg in both eyes. A very thin layer of fibrin was still present in the lens of the right eye, which was only visible in mydriasis. Posterior synechiae were found at 8 and 4 o'clock. The hyphema was no longer present. The iris vessels were also less filled. Due to the fibrin, the fundus insight was slightly reduced. The papillae presented a sharp edge and a normal aspect for the age of the patient. Retinal defects were not visualized, and the vessels were well visible.

**Conclusion**

The most likely cause of the bleeding is traumatic birth. Monitoring bleeding reabsorption is crucial for avoiding long-term complications such as glaucoma, vision development problems, and structural damage.

 

## P 30

### A neonate with preseptal cellulitis - challenges in management

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**Introduction**

Preseptal cellulitis is a common presentation in children but rather rare in the neonatal period. Given the anatomical, microbial factors and related complications, the management and treatment strategies must be modified for neonates.

**Case**

A 6-day -old girl presented with redness and swelling of the left eyelid as well as yellow discharge and conjunctivitis. On examination no signs of protrusion bulbi, normal pupillary reaction to light, evaluation of eye movement was challenging. Further she presented in good general conditions, feeding well and afebrile. The girl was born at 39 5/7 weeks of gestation by vaginal delivery, rupture of the membrane was 5 hours before delivery. Pregnancy had been unremarkable with negative maternal serology results and a negative group B streptococcal (GBS) and Chlamydia swab. Based on clinical presentation, she was started empirically on gentamicin and amoxicillin. Blood cultures were positive for Streptococcus mitis and antibiotics were adjusted accordingly. In total she was treated for 10 days. Eye swab for Chlamydia and bacteria remained negative. Clinical improvement occurred in the first 48 hours of treatment.

**Discussion**

Assessment of clinical features such as ophthalmoplegia, pain with eye movements and impaired visual acuity are even more difficult in neonates. From an anatomical perspective the orbital septum is still developing, which poses a higher risk of retrograde extension of infection from the preseptal to the orbital space. Furthermore, in general neonates have a higher risk of associated bacteremia and meningitis. Taken this into account neonates should be started always on intravenous antibiotics after taking cultures and managed as presumed orbital cellulitis. For possible complications such as intraorbital or subperiostal abscess imaging should be considered early on in neonates.

Common causative agents in preseptal cellulitis are Staphylococcus aureus, Streptococcus pyogenes and epidermidis. In the neonatal population attention should be paid especially to possible infections of the eye with Chlamydia and Gonococci as well as cellulitis caused by GBS. Furthermore, in neonates completion of the septical work up with lumbar punction should be discussed early on.

**Conclusion**

Preseptal cellulitis in neonates can occur and should be treated as presumed orbital cellulitis.

## P 31

### THE APPROACH OF PHYSIOLOGICAL-BASED UMBILICAL CORD CLAMPING: A CASE REPORT AND DISCUSSION**:**

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**Aims and objectives**

The aim of this case report is to highlight the feasibility of performing physiological-based umbilical cord clamping (PBCC) using a mobile resuscitation table to support cardiovascular transition of a preterm neonate with a congenital pulmonary airway malformation (CPAM).

**Case history**

We report a case of a 35-week-old neonate with prenatally diagnosed progressive macrozystic giant CPAM and hydrops fetalis. The infant was born by primary cesarean section and was immediately transferred to the mobile resuscitation table (Concord Birth Trolley®). The umbilical cord was kept intact until lung aeration was established using positive pressure ventilation and was clamped in the 11th minute of life. Sonographically controlled puncture of two large cysts in the left hemithorax and following drainage insertion was successfully performed intrapartum. Cardiopulmonary stability was given during the entire resuscitation.

**Discussion**

The conversion of fetal circulation at birth is a critical process, as the lungs must take over gas exchange from the placenta within a short period of time after cord clamping. Initiated by lung aeration pulmonary vascular resistance (PVR) reduces, whereas pulmonary blood flow (PBF) increases. After cord transection, PBF is the only source of left ventricular preload and thus crucial for adequate stroke volume.1 Immediate cord clamping (ICC) can cause a sudden drop in cardiac output, heart rate and blood pressure, resulting in large disturbances in systemic and cerebral hemodynamic. This can be avoided by PBCC, which involves deferring cord clamping until the lung has aerated.2 This increases PBF, facilitates pulmonary gas exchange and increases left ventricular output since the source of preload can easily switch from umbilical to pulmonary venous return.1 Previous studies have shown that delayed cord clamping (DCC) reduces mortality3 and improves long-term neurological development.4

In case of congenital malformations, using PBCC with a mobile resuscitation table can provide additional time for live-saving interventions. Unexpected complications such as increased maternal bleeding are minimal.5 Therefore, PBCC using the Concord is a promising approach improving neonatal outcome.

**Conclusion**

We claim that the stabilization of preterm infants or neonates with congenital malformations impeding neonatal adaptation using PBCC should become the future standard of interdisciplinary neonate care for best possible neonatal adaptation.

## P 32

### Dyspnea and chest pain as primary presentation of post-streptococcal Glomerulonephritis

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**Background**

Post-streptococcal glomerulonephritis (PSGN) is the most common etiology of acute glomerular disease in children. This immune-complex-mediated glomerulonephritis typically occurs 1-4 weeks after an infection with a nephrogenic strain of group A beta-hemolytic streptococci (typically after pharyngitis or impetigo). When symptomatic, classical clinical signs include features of nephritic syndrome, such as hematuria, oedema, and hypertension. Chest pain and dyspnea are less frequently seen but can indicate symptomatic hypertension and pulmonary edema due to fluid overload.

**Case report**

A 13-year-old previously healthy boy presented at our emergency department with dyspnea, chest pain and cough which developed over the course of the last 24 hours. Furthermore,

 

he noted swelling of the face since the previous day and reported weight gain of 7 kg. On repeated questioning, he reported a mild upper airway infection with a sore throat 10 days ago.

Initial physical examination revealed blood pressure of max. 179/111 mmHg (95 P. + 47 mmHg) tachypnoea, and increasing oxygen requirement. There was no apparent clinical oedema. Cardiac assessment showed a mild pericardial effusion without hemodynamic relevance, good biventricular function, but elevated BNP (2218 ng/l) and troponin (17ng/l) values. Laboratory findings showed glomerular micro-hematuria, mild proteinuria and a decreased eGFR of 79 ml/min/1.73 m2. Chest x-ray showed interstitial edema.

He was transferred to our intensive care unit and antihypertensive therapy with amlodipine, intravenous labetalol, and furosemide was established, whereupon the chest pain rapidly resolved.

Suspected acute post-streptococcal glomerulonephritis was supported upon receiving the positive anti-streptolysin (ASO) and anti-streptodornase B antibodies, and reduced complement C3 levels (<0.1 g/l).

The patient had a favorable clinical course with termination of intravenous antihypertensives after five days and good pulmonary recovery.

**Conclusions**

This case illustrates an atypical presentation of PSGN with acute hypertensive crisis with chest pain and dyspnea as presenting symptoms.

Typical clinical features of PSGN usually include the triad of oedema, macro-hematuria, and hypertension. However, rarely a symptomatic hypertensive crisis, as seen in our patient, is the primary clinical finding of a patient with PSGN.

## P 33

### Kidney tubular injury induced by valproic acid: systematic literature review

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**Background**

Valproic acid is prescribed for epilepsy and as prophylaxis for bipolar disorder and migraine headaches. While generally considered safe, valproic acid has been implicated as a cause of either biochemical abnormalities consistent with a proximal tubular injury (De-Toni-Debré-Fanconi syndrome) or an isolated tubular proteinuria. To address this issue and to speculate on the underlying mechanisms, we undertook a review of the literature.

**Methods**

Searches were conducted in Excerpta Medica, the National Library of Medicine, and Web of Science following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses methodology. Gray literature was also considered. Data were assessed by two of us in a non-blinded fashion. Discrepancies were solved by consensus and, if needed, by consultation with a senior author.

**Results**

Twenty-eight case reports addressed 43 children and 5 adults with epilepsy on valproic acid for seven months or more who presented with laboratory abnormalities consistent with a proximal tubular injury. Most patients presented with hypophosphatemia, normoglycemic glycosuria, proteinuria and metabolic acidosis. A biopsy was obtained in six cases and disclosed altered proximal tubular cells with mitochondrial damage. Valproic acid was stopped in all 43 cases and all documented patients remitted subsequently within 12 months. Furthermore, eight case series documented an isolated tubular proteinuria in 285 epileptic children on valproic acid for seven months or more.

**Conclusions**

Valproic acid administered for seven months or more can rarely induce a transitory proximal tubular injury due to a mitochondrial toxicity. These patients presented with the typical features of de Toni-Debre-Fanconi syndrome. Valproic acid may be also associated with an isolated tubular proteinuria (https://doi.org/10.1007/s00467-022-05869-8).

## P 34

### Severe hypomagnesemia and TRPM6 mutation

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The TRPM6 (transient receptor potential melastatin) channel is expressed in the apical membranes of intestinal cells and in cells of the distal convoluted tubule and allows transcellular reabsorption of magnesium. Mutations in the gene coding for the TRPM6 channel are revealed in children by severe symptomatic hypocalcemia and hypomagnesemia.

We report here the case of a 2-year-old girl who presented with convulsions leading to the discovery of profound hypomagnesemia with secondary hypocalcemia due to an autosomal recessive mutation of the TRPM6 gene.

This child born to non-consanguineous couple from Ukraine had been followed since she was 6 months old for generalized seizures with a normal brain imaging performed in Ukraine but was not responsive to levetiracetam. Following an episode of febrile seizure at the age of 2 years on arrival in Switzerland, and in the presence of an obvious global developmental delay, profound hypocalcemia (minimum 0.28 mmol/L, reference values 1.17-1.32 mmol/L) was diagnosed, associated with hypomagnesemia (minimum 0.20 mmol/L, reference values 0.7-1.1 mmol/L). The initial phosphocalcic assessment showed normal phosphorus, low vitamin D, low PTH and metabolic acidosis. The patient received intravenous calcium gluconate and magnesium sulfate supplementation before an oral treatment, without recurrence of seizure after more than 6 months of substitution. A genetic analysis revealed two variants in the TRPM6 gene sequence on chromosome 9, a nonsense variant and a missense variant, whose clinical picture already described in the literature, could explain the patient's symptoms.

The c.1003C>T nonsense variant identified in the patient is autosomal recessive, it causes loss of function of the TRMP6 channel and is responsible for a defect in intestinal magnesium absorption, rather than an abnormal renal excretion of magnesium. The identified c.2150A>G missense variant is pathogenic but of uncertain significance.

Autosomal recessive mutations in the TRPM6 gene result in hypomagnesemia and secondary hypocalcemia. The disease usually reveals itself in the first year of life by generalized epileptic seizures. Electrolyte balance is maintained in the long term by

 

oral substitution of magnesium. If left untreated, the disease can lead to neurological damage and be lethal. The challenge is therefore to recognize and treat these pathologies early.

## P 35

### Case Report: Potts Puffy Tumor as complication of rhinosinusitis in an andolescent

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**Introduction**

Potts puffy tumor (PPT) is defined as a complication of a frontal rhinosinusitis associated with osteomyelitis of the frontal bone and consecutive subperiosteal abscess formation. It is a rare entity in pediatrics that requires interdisciplinary management as well as antibiotic and operative intervention. Intracranial complications occur in 3-10% and need to be diagnosed and treated fast.

**Case**

A 13 -year -old, healthy boy presenting in our hospital with increasing forehead swelling, frontal headache and high fever following a febrile rhinosinusitis with cough. There were no signs of double vision or vision impairment. Endonasally on the left side was oedematous mucosal tissue with pus. In a nasal swab Influenza A was verified.

He was diagnosed with PPT associated to left-sided pansinusitis, osteomyelitis of frontal bone and epidural abscess formation by computed tomography (CT) and magnetic resonance imaging (MRT). An empiric broad spectrum intravenous antibiotic treatment was established and followed by combined endoscopic and open surgical approach (FESS (functional endoscopic sinus surgery and open frontal sinus trephination)) by otorhinolaryngologists. Microbiologically streptococcus intermedius could be found in a sampling of the abscess formation in sinus frontalis, blood cultures remained negative. A magnetic resonance imaging 2 weeks later showed a progress of the epidural abscess formation without clinical impairment, why consecutively neurosurgical drainage of the abscess by trepanation was undertaken. The broad-spectrum antibiotic treatment is still ongoing at this moment in an ambulatory setting and regular clinical and imaging controls by magnetic resonance imaging are done.

**Discussion**

Due to anatomical features, even though PPT is a rare condition adolescents are predominately affected. Also, the incidence of intracranial complications is reported higher in this age group compared to children, therefore it requires a high index of suspicion and prompt evaluation and aggressive treatment. Antimicrobial therapy alone is insufficient for PPT. Surgical intervention can be performed externally, endoscopically, or in combination. Goals are to drain abcess material and prevent spreading of infection.

**Conclusion**

Our case summarizes all the main aspects of PPT with typical clinical presentation as well as typical age group and intracranial complications with epidural abscess being the most common.

## P 36

### Thrombophlebitis of a superficial temporal vein as an extracranial complication of bacterial sinusitis: A case report and review of literature

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**Background**

Approximately 7% of upper respiratory tract infections in children are complicated by acute bacterial sinusitis (ABS). Complications of ABS are rare, occurring in less than 1% of cases. Intracranial complications include meningitis, empyema, abscess and venous sinus thrombosis. Extracranial complications of ABS outside the orbit are extremely rare. There are only two other published cases, both with thrombophlebitis originating from orbital cellulitis, one involving a child with thrombophlebitis of a facial vein and one involving an adult with thrombophlebitis of the superficial temporal vein.

In this article, we describe for the first time a case of a thrombophlebitis of the superficial temporal vein as an extracranial complication of ABS in a child.

**Case presentation**

A 9-year-old boy presented with high fever for 4 days, headache and painful left sided temporal swelling. Inflammatory parameters were markedly elevated and blood cultures showed growth of Streptococcus intermedius after 24 hours. Duplex ultrasound revealed a suspected thrombophlebitis of the left superficial temporal vein with concomitant soft tissue swelling. A CT-scan and subsequent MRI confirmed the finding, without any signs of an underlying osteomyelitis or intracranial thrombosis. In addition, a pronounced sinusitis of the frontal, ethmoidal and maxillary sinuses on the left side was visualized as well as focal, left anterior meningitis. We hypothesize spread of inflammation from the nasal sinus to the temporal vein via the also inflamed masticatory muscles with consecutive thrombosis. The patient was placed on intravenous antibiotics as well as low molecular weight heparin. With this therapy, he recovered completely except for the persistent long segmented occlusion of the superficial temporal vein.

**Conclusion**

Diagnosis of ABS with soft tissue swelling of the forehead should alert the physician to the need of further investigation for complications, e.g thrombosis.

With only 3 reported cases (including our patient), extracranial thrombosis is a very rare complication of ABS.

Although no clear recommendation is possible, case reports and series concerning other head and neck infections indicate that antithrombotic therapy with low molecular weight heparin is safe and may prevent further spread of the thrombus.

 

## P 37

### EBV-associated acute dacryocystitis: an atypical manifestation of a common infection

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**Introduction**

Epstein-Barr virus (EBV) is the main cause of infectious mononucleosis, a condition characterized by fever, sore throat, rhinitis, fatigue, lymphadenopathy (mainly cervical) and splenomegaly. This is a very common infection, with 90-95% of the general population being seropositive for EBV. EBV-associated dacryocystitis, however, is an extremly rare clinical pediatric manifestation of the disease, often underdiagnosed and unnecessarily overtreated.

**Methods**

We report a case of acute dracyocystitis associated with infectious mononucleose after EBV infection in a 3- year-old boy admitted to our emergency department for generalized rash, cervical bilateral lymphadenopathy, and eyelid edema without fever. He was treated with amoxicillin for 7 days (suspicion of S. pyogenes tonsilitis) and was in good clinical condition otherwise.

**Results**

Blood tests revealed a slight leukocytosis (11.500 cell/mm3) with lymphocytosis and rare activated lymphocytes on the blood smear. CRP was low at 5.8 mg/dl. A mild elevation of hepatic transaminases was noticed. The urinary tests were negative for proteinuria or hematuria. Cervical echography demonstrated multiple bilateral inflammatory lymphadenopathies (the largest measuring 4.6 cm x 2.3 mm) and excluded a possible abscess as well as a suppression of the smooth cervical tissues. Serology was positive for viral acute mononucleosis with positive IgM and negative IgG for EBV. After conservative treatment, the child recovered completely.

**Conclusions**

The diagnosis of acute dacryocystitis related to EBV infection is an uncommon entity, mostly benign, but important to recognize since the workup and outcome are very different from an abscess of the ocular region. With simple conservative measures, the outcome is often excellent.

## P 38

### Severe pulmonary pneumocystosis in non-immunocompromised children: about a case

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**Background**

Pulmonary pneumocystosis (PCP) is a generally mild infection of early childhood with proportions of seroconversion reported before the age of 2 years of around 85%. Severe forms are generally found in children with weakened immune system.

**Case presentation**

We report a case of severe pulmonary pneumocystosis in a 4-month-old infant known for non-syndromic biliary atresia. Despite a fairly standard clinical and radiological presentation, the patient was neither infected with HIV nor on long-term corticosteroid therapy or immunosuppressants. Furthermore, no other cause of immunosuppression has been demonstrated anamnestically or biologically.

**Conclusion**

A picture of rapidly progressive hypoxemic pneumonia with radiological interstitial syndrome should suggest the diagnosis of pulmonary pneumocystosis even in the absence of obvious immunosuppression factors. It is also relevant to consider the possibility of additional risk factors for PCP.

## P 39

### Endocarditis on a native heart: case report

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We report the case of a five-year-old girl, known for development delays, an antenatal left renal pelvis dilatation with spontaneous resolution, and bilateral postaxial polydactyly. No known genetic mutations were found. The echocardiography performed in March 2022 was normal.

She came to the emergency department with a history of apathy, fever, and cough for one week. Clinical examination confirmed a reduced overall condition, signs of moderate dehydration, sinus tachycardia, and fever. Laboratory investigations showed moderate signs of inflammation (CRP 181 mg/l) . PCR for Influenza B was positive on the nasal swab.

The patient was treated with Co-amoxicillin and Oseltamivir. Methicillin-Sensitive Staphylococcus aureus (MSSA) was identified in the blood culture. The antibiotic spectrum was narrowed according to the antibiogram. Four days into the hospitalization, a Janeway lesion on her 5th right toe and an Osler node on her 5th right finger appeared. She had a new pain in the right knee and an inability to walk. Echocardiography confirmed mitral valve endocarditis with vegetation. Magnetic resonance imaging (MRI) of the lower extremities revealed joint effusion of both knees and the right hip. Joint aspiration came back positive for MSSA in the right hip, characteristic of a secondary septic arthritis. Ophthalmologic examination showed grey spots compatible with Roth spots. A brain MRI revealed septic emboli and brain abscess bilaterally. The mitral vegetation was surgically removed, and a valvular repair was performed.

The post-operative echocardiography showed a good biventricular function with mild mitral valve regurgitation. A follow up MRI measured a decrease of all cerebral lesions The blood culture drawn after surgery remained negative.

The patient evolved favorably and was discharged in good general condition after three weeks of hospitalization. One month later, a follow-up echocardiography was performed showing a mild stenosis and regurgitation of the mitral valve with no other anomalies. Follow-up-MRI, after two months, revealed regression of lesions.

Endocarditis in the pediatric age group is rare, the incidence ranges between 0.3 to 3.3/100 000. It mainly affects patients with risk factors like rheumatic valvular diseases, cyanotic congenital heart disease, degenerative valve lesions, or an indwelling central venous catheter. However, 8-10% of endocarditis cases still occur in children without identifiable risk factors.

 

## P 40

### Acute pancreatitis associated with atypical bacterial pneumonia: systematic literature review

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**Background**

Many non-pulmonary features have been seen to occur in association with an atypical bacterial pneumonia and include among others nervous system manifestations, diarrhea, rashes, altered liver enzymes, or kidney injury. Acute pancreatitis has been associated with atypical bacterial pneumonia since 1973.

**Methods**

We performed a systematic review of the literature in the Excerpta Medica, National Library of Medicine, and Web of Science databases. We retained 27 reports published between 1973 and 2022 describing subjects with an otherwise unexplained pancreatitis temporally associated with an atypical bacterial pneumonia.

**Results**

The reports included 33 subjects (19 males, and 14 females; 8 children and 25 adults) with acute pancreatitis temporally associated with an atypical pneumonia caused by Mycoplasma pneumoniae (N = 18; children, N = 8; adults, N = 10), Legionella species (N = 14; adults, N = 14) or Coxiella burnetii (N = 1; adults, N = 1). About 90% of patients (N = 29) concurrently presented with the respiratory and the pancreatic disease. No cases associated with Chlamydophila pneumoniae, Chlamydophila psittaci or Francisella species were found.

**Conclusions**

Acute pancreatitis has been associated with various infectious agents. In children, the leading infectious cause of pancreatitis is known to be mumps. The present review documents the association with atypical pneumonia induced by Mycoplasma pneumoniae, Legionella species and Coxiella burnetii, whereas Mycoplasma pneumoniae appears to be especially important in children.

## P 41

### Liver Microcalcifications, Changes in lung X-ray and sonographic lung Abnormalities with positive Serology of E. multilocularis: A

**Case report:** Liechti N[1], Gessler P[1], Grimm M[1], Stiebing C[2]

*[1]Pediatric Department, Kantonsspital Münsterlingen, Switzerland; [2]Medical Office of pediatrics, Ermatingen, Switzerland*

We report a four and a half-year-old boy hospitalised twice at our pediatric department. First hospitalisation was in November due to a community-acquired pneumonia. Because of abdominal pain, we sonographically found multiple microcalcifications in the liver. The patient was treated and was discharged on oral antibiotic therapy. We planned a control of the liver in 1-2 months. Three days before the scheduled appointment, the boy showed again at our emergency department with a diagnosis of post streptococcal glomerulonephritis (anti-streptolysin titer 3390UI/ml).

Lung X-ray revealed a roundish, non-specific suspicious lesion of about 1x1 cm in size on the left apical side. Furthermore, we found liver microcalcifications and pleural effusion with bilateral basal infiltrates. Tuberculosis, hemolytic-uremic syndrome, Cytomegaly- and Ebstein-barr virus was excluded. We tested for echinococcus with serology including a westernblot.The course of post streptococcal glomerulonephritis was uneventful.

After discharge, we received a positive finding for Echinococcal disease (EgHF/E.sp./IgG Elisa 23 positive; EITB Echino/E.sp./IgG, AgB-WBlot positive; EmG11/E. multilocularis/ IgG ELISA 43 positive and Em18-ELISA/ E.multilocularis/IgG 0 negative). Results matching to an alveolar hydatid disease.

Microcalcifications of the liver are a very rare finding in children, even rarer is the disease of an echinococcus. On inquiry, we learned from the family, which lives in a rather rural environment, that two dogs live with the two children. Echinococcal disease is mostly the cystic form, with rodents acting as intermediate hosts. In Switzerland, there has been an increase of E. multilocularis due to expansion of foxes into populated areas (Alexander Schweiger, 2007). Now, our patient is under evaluation for treatment.

Further data are needed to have more insight of the course of seropositive echinococcal disease, especially as the alveolar echinococcal disease is thought to be increasingly diagnosed in children during the next years. In our patient, there will be sonographic control, lung imaging and a control serology in three months.

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## P 42

### Transphyseal Osteomyelitis: An epidemiological, bacteriological, and radiological retrospective cohort analysis.

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Transphyseal hematogenous osteomyelitis (THO) is a serious condition that can affect the growing physis, yet it is insufficiently recognized in children. This study explored the prevalence, epidemiology, and pathophysiology of pediatric THO.

All the consecutive cases of acute and subacute osteomyelitis admitted to our institution over 17 years were studied retrospectively. Medical records were examined for patient characteristics, bacteriological etiology, and medical and surgical management. Magnetic resonance imaging was reviewed for all patients to identify those with tran-sphyseal spread of infection. For positive cases, the surface area of the transphyseal lesion was estimated relative to the total physeal cross-sectional area.

Fifty-four (25.7%) of the 210 patients admitted for acute or subacute osteomyelitis were diagnosed with THO. The study population's ages ranged from 1 month to 14 years old (median age 5.8 years, interquartile range 1–167 months). Fourteen patients were younger than 18 months old; the remaining 40 had a mean age of 8.5 years old. The most common sites of THO were the distal tibia (29.1%), the proximal tibia (16.4%), and the distal fibula (14.5%). Transphyseal lesions were due to acute infection in 41 cases and to subacute osteomyelitis in 14 cases. The two

 

most frequently identified pathogens were Staphylococcus aureus (49.1%) and Kingella kingae (20.0%). An average transphyseal lesion represented 8.9% of the total physeal surface, and lesions comprised more than 7% of the physeal cross-sectional area in 51% of cases.

Our study revealed that pediatric THO was more frequent than commonly thought. Transphyseal lesions were frequently above this 7% cut-off, which is of paramount importance since subsequent growth is more likely to be disturbed when more than 7% of the physeal cross-sectional area is injured. THO also affected children older than 18 months, an age at which transphyseal arterial blood supply to the epiphysis is believed to have disconnected. This finding suggests another pathophysiological reason for the transphyseal diffusion of infection, a topic deserving further studies and greater understanding.

## P 43

### Presumptive bacteriological diagnosis of spondylodiscitis in infants less than 4 years by detecting K. kingae DNA in their oropharynx: Data from a preliminar two centers study

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#### Background and objectives

Most cases of spondylodiscitis in children aged between 6 and 48 months old could be caused primarily by K. kingae. The present prospective study aimed to determine whether an innovative and indirect diagnosis approach - based on detection of K. kingae DNA in the oropharynx of children with suspected spondylodiscitis – provides sufficient evidence that this microorganism is responsible for the infection.

#### Methods

We prospectively analysed infants admitted for spondylodiscitis, considering above all the results of PCR realized in oropharyngeal swabs and in blood samples.

#### Results

Four of the 29 performed K. kingae-specific real-time PCR assay in blood were positive (13.8%), whereas 28 of the 32 K. kingae-specific realtime PCR assay realized on throat swabs were positive (87.5%).

#### Conclusions

This study demonstrates that performing oropharyngeal swab PCR is able to detect K. kingae in almost 90% of the toddlers with confirmed spondylodiscitis. That provides strong arguments for the hypothesis that K. kingae should be considered as the main aetiological pathogen to suspect in children between 6 and 48 months old with spondylodiscitis. Finally, it seems to us reasonable that oropharyngeal swab may become an early decision-making tool for the indirect identification of K. kingae in spondylodiscitis.

## P 44

### The Necrotizing Pneumonia

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#### Introduction

Necrotizing pneumonia (NP) is rare, however severe complication of community acquired pneumo-nia (CAP). Most children with NP are young (<5 years) and previously healthy.

#### Case

5-year old girl, born in Switzerland, previously healthy, fully vaccinated, presented with fever, cough and left sided chest pain since four days. Amoxicillin had been started for suspected CAP. Bloods: CRP 184 mg/l, Lc 19.5 G/l. Chest x-ray showed an infiltrate in the left lower lobe with a gas-liquid level suggesting NP. Antibiotic therapy was escalated to Amoxicillin-Clavulanate. Chest CT confirmed NP of the lower lobe with a large central cavern (diameter ca. 35x40x30 mm). Blood cultures remained negative. Antibiotic therapy was continued for 3 weeks (4 days i.v., 17 days oral), the clinical evolution was favourable. Follow-up imaging is pending.

#### Discussion & conclusion

This case illustrates that, despite presence of a large air and liquid filled cavern, NP can primarily be managed conservatively. Chest CT helps differentiating NP from lung abscess, which may re-quire an intervention or longer treatment. The most common reported pathogen in NP is S. aureus. Therefore, empiric treatment should include a beta-lactamase stable antibiotic. Follow-up imaging is recommended to exclude congenital pulmonary airway malformation (CPAM).

## P 45

### Group A Streptococcal Pharyngitis: six days Amoxicillin orsix Days placebo in children between 3 and 15 years of age: a randomized, double-blind, multicentre, non-inferiority trial. The GASPARD Study

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#### Background and aims

Group A Streptococcus (GAS) is a common bacterial cause for acute pharyngitis. Antibiotics have traditionally been used to reduce the risk of complications, but recent studies have shown that benefits of antibiotics may be limited, particularly in developed countries where the incidence of complications has declined significantly. Reducing the duration of symptoms may be the only reasonable benefit. Our study aims to evaluate if placebo is non-inferior to amoxicillin in reducing the duration of fever.

#### Methods

We randomized 88 children between 3 and 15 years of age presenting with acute symptoms of pharyngitis and a positive rapid

 

antigen detection test for GAS in three Swiss hospitals to receive a 6-day treatment of either placebo (n = 46) or amoxicillin (n = 42). Patients with immunodeficiency or any risk factors for complications were excluded. Primary outcome was fever duration, with a non-inferiority threshold set at 12 hours. Secondary outcomes included pain intensity and complications of streptococcal pharyngitis.

**Results**

In per-protocol analysis, mean difference in fever duration between amoxicillin and placebo was 2.0 hours (95% CI -8.3 to 12.3), with a similar result in the intention-to-treat analysis (2.8 hours, 95% CI -6.5 to 12.2). Early complications were observed in 6 patients (5.7%) in the placebo group and 2 patients (2.3%) in the amoxicillin group (relative risk 2.15; 95%CI 0.44 to 10.57): all were identified early and recovered well. No statistically significant difference was observed in pain intensity (measured with VAS score) between groups over the 7 days following inclusion, with a largest difference of 0.5 (95% CI -0.62 to 1.80) observed on the third day from enrollment.

**Conclusion**

Placebo is non-inferior to amoxicillin in reducing the duration of fever. Pain intensity and risk of complications were similar in the two groups. These findings support restrictive antibiotic treatment of streptococcal pharyngitis.

## P 46

### Is a shorter antibiotic treatment duration increasing the risk for relapse in pediatric acute focal bacterial nephritis (AFBN)?

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**Case**

An 11-year-old girl presents with nine episodes of pyelonephritis over a period of 18 months. Each episode is accompanied with flank pain, abdominal pain and fever. Urine culture shows Escherichia coli 10E6/ml. She is treated with oral cephalosporines. Renal ultrasound is unremarkable. On the sixth episode, magnetic resonance imaging (MRI) is performed due to a breakthrough infection despite antimicrobial prophylaxis, and a pronounced bilateral nephritis is shown. Therefore, diagnosis of an acute focal bacterial nephritis (AFBN) is suggested. Her treatment is changed to nitrofurantoin for 14 days. Due to persistence of symptoms and bacteriuria with E.coli, a 14-day-course of intravenous ceftriaxone followed by oral prophylactic treatment is given. Nonetheless, she presents with new renal lesions on the follow-up MRI four weeks later, which prompts us to restart intravenous antibiotic therapy with ceftriaxone for four weeks. A cystography reveals low-grade unilateral vesico-urethral reflux (VUR) which is surgically treated. She is asymptomatic since.

**Structured Clinical Question**

In children with evidence of AFBN (condition), is a short duration of antimicrobial therapy or underlying urological pathology (intervention) associated with the risk of recurrence (outcome)?

**Search**

We performed a literature review by one author in EMBASE and MEDLINE via Ovid, pubmed and google scholar without time and language restriction and identified 14 articles including retrospective and prospective studies enrolling pediatric individuals with AFBN. Search terms included acute focal bacterial nephritis, acute lobar nephronia, children, pediatric, relapse, recurrence. All references were cross-checked for additional relevant articles. Subsequent data extraction was performed regarding antimicrobial duration, underlying urological conditions and possible recurrence.

**Results**

The current evidence includes two randomized controlled studies and one retrospective cohort study suggesting that a 3-week duration of treatment for AFBN has a lower risk for relapse (0-2%) compared to 2-week duration.Treatment administration can be done as intravenously with a switch to oral after defervescence.

## P 47

### Epidural empyema complicating pansinusitis in an Influenza B positive boy

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**Background**

Influenza infection causes a significant burden of disease in children. Intracranial abscesses may occur as rare but potentially life-threatening complication.

**Methods**

Case report and review of literature.

**Case report**

This previously healthy and immunocompetent 8-year-old boy presented to our emergency room on the 8th day of Influenza B infection with persistent fever, rhinitis, headache, mild nausea, vomiting, and loss of appetite. His general condition and neurological exam were normal. No periorbital abscess or frontal swelling was present. Laboratory findings were unspecific. He was discharged with a symptomatic therapy. Six hours later, he developed a status epilepticus and was flown to a tertiary intensive care unit. Brain imaging revealed a frontal epidural empyema secondary to pansinusitis. Emergency surgical drainage and initiation of broad-spectrum antibiotic treatment was installed. Streptococcus A was isolated. He totally recovered after 8 weeks of intravenous antibiotics.

**Discussion**

The most common complications of Influenza infection are pneumonia, sinus problems and ear infections and worsening chronical problems like heart disease or asthma. Intracranial extension of rhinosinusitis is rare; the pathogenesis includes progression of septic thrombi through the valveless diploic veins, direct extension of infection from osteomyelitis of the bony sinus walls, or penetration through congenital or post-traumatic bone defects. The mean duration of symptoms is 10 to 13 days before diagnosis. Only few patients report symptoms or a history of sinusitis. Clinical manifestations almost always include headache and fever. Seizures occur in up to 30%. Periorbital cellulitis or Pott puffy tumor is common. ESR and CRP are usually markedly elevated. Alpha- and beta-hemolytic streptococci are the most common pathogens. Contrast-enhanced head CT or MRI are usually diagnostic. Early recognition and treatment with drainage of intracranial collections and long-term antibiotic therapy are essential to reduce morbidity and mortality.

 

### Conclusion

While intracranial complications of sinusitis are rare, the morbidity and mortality remain high. Since this condition cannot be prevented, early recognition and treatment is crucial. Regarding the low frequency of epidural empyema as a complication of influenza infection and consecutive rhinosinusitis there is no need for adaptation of the current Influenza immunization and sinusitis treatment guidelines.

## P 48

## PREDICTING EPIDEMICS WITH MATHEMATICAL MODELS - WHAT COVID-19 TAUGHT US ON RSV

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### Background

Respiratory syncytial virus (RSV) is the most important cause of bronchiolitis and pneumonia in children younger than 5 years worldwide. In western countries, RSV is estimated to cause about 20% of lower respiratory tract infections in children, with most of the disease burden occurring in children younger than 1-year-old. A distinct alternating pattern of minor and major seasons of RSV infection has been reported in several North and central European countries, as well as in some parts of North America. Here we report on over 20 years data of hospital admissions due to RSV at the University Children's Hospital Bern, a tertiary paediatric centre in Switzerland, and the impact of non-pharmaceutical interventions (NPI) during the SARS-CoV-2 pandemic.

### Methods

We captured all hospital admissions due to RSV at the University Children's Hospital Bern, from December 1997 until December 2022. We implemented a susceptible-infected-recovered-susceptible (SIRS) dynamic transmission model with waning immunity and seasonal forcing, described by a series of ordinary differential equations, to model RSV epidemiology.

### Results

From December 1997 until December 2022, 5083 children with RSV infection were admitted to the University Children's Hospital Bern. Before the COVID-19 pandemic, we observed an alternating cycle of minor and major seasons. While no child was hospitalised with RSV infection in winter 2020/2021, we observed an out-of-season increase in the number of hospital admissions in summer 2021. A SIRS model captured the previous local epidemiology well with a root-mean-square-error of 3.61, compared to weekly case numbers. Modelling the impact of COVID-19 associated NPI on RSV epidemiology failed to capture the out-of-season increase in summer, but correctly predicted a larger than usual season for the winter 2022/2023. According to the model, it may take several years to return to the previous epidemiology.

### Conclusions

A simple mathematical model captured RSV epidemiology, including features of the changed disease dynamics following COVID-19-associated NPI, at the University Children's Hospital Bern.

## P 49

## Changes in prevalence of respiratory viruses in healthy infants mediated by SARS-CoV-2 pandemic measures

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### Background

Fortunately, healthy infants and children do normally not suffer from severe infections with SARS-CoV-2. However, consequences of asymptomatic carriage or pandemic control measures are unclear. Respiratory viral infections are a major cause of morbidity and mortality in children. Thus, it is important to understand how SARS-CoV-2 infections or prevention measures affect the transmission of common respiratory viruses.

### Objectives

We aimed to study the prevalence of SARS-Cov-2 and common respiratory viruses in healthy infants before and during the pandemic.

### Methods

Biweekly nasal swabs of 34 healthy infants from the Basel Bern Infant Lung Development Cohort followed throughout the first year of life were analysed for 9 different respiratory viruses by Multiplex-PCR. Respiratory symptoms were assessed by weekly telephone interviews. We compared data assessed prior the pandemic (E1, n = 94), during strict lockdown measures (E2, n = 215), and when most restrictions were relaxed (E3, n = 339).

### Results

We analyzed 648 nasal swabs between 2019-2022. In 179 (28%) of all swabs we found any respiratory virus and of those 40 (23%) were symptomatic. Virus prevalence was lower during the first lockdown phase compared to data assessed before, followed by a rebound of respiratory viruses after restrictions were relaxed (27%, 95% CI 18-37% in E1; 19%, 95% CI 14-25% in E2; 33%, 95% CI 28-39% in E3; p = 0.001). Rhinovirus persisted during the study period, whereas other viruses vanished in E2 with a strong increase in E3 (e.g. Adenovirus: 1.1%, 95% CI 0.06%-6.6% in E1; 0.5%, 95% CI 0.02%-3% in E2; 4.1%, 95% CI 2.4%-7.0% in E3; p = 0.015). SARS-CoV-2 was only detected in E3 and prevalence was low (2.4%). Respiratory symptoms were reported in 25% of SARS-CoV-2 cases, which is comparable with overall reported symptoms in E3.

### Conclusion

SARS-CoV-2 infections as well as asymptomatic carriage in our cohort are low. However, we saw relevant alterations of viral colonization driven by measures of precaution with still unknown epidemiological consequences.

 

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## CLINCAL CHARACTERISTICS AND MANAGEMENT OF CHILDREN HOSPITALIZED WITH PYOMYOSITIS IN SWITZERLAND: A RETROSPECTIVE STUDY

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### Background

Pyomyositis, a bacterial infection of the muscle, is an important differential diagnosis in children with musculoskeletal pain, yet diagnosis is often missed or delayed due to non-specific clinical presentation.

The primary objective of the study was to collect experience with pyomyositis by chart review in hospitalized children.

### Methods

Patients <18 years of age hospitalized with pyomyositis between January 2010 and June 2022 were included in this retrospective study in 9 hospitals via the Paediatric Infectious Diseases Group Switzerland (PIGS). Cases were identified by ICD 10 code M60-M60.9 and classified as probable or definite pyomyositis depending on clinical presentation, pathogen detection and imaging studies. Data on clinical presentation, microbiology, diagnostics, and management were extracted from hospital records. Here we present an interim analysis.

### Results

Of 334 cases identified through ICD-10 code, 40 (12%) had definite primary pyomyositis, 24 (7%) had pyomyositis associated with septic arthritis or osteomyelitis and 33 (10%) had probable pyomyositis and 237 (71%) did not fulfil the case definition.

Age range at presentation of the 97 patients included in further analysis was 2 weeks - 17 years (median 8 years). The majority (85 patients, 88%) had no underlying illness. Duration of symptoms at presentation was 0-14 days (median 3 days). All patients had fever and pain at presentation and 37 (38%) had swelling at the respective localisation. Pelvic and leg muscles were most often affected.

S. aureus and S. pyogenes (33 and 9 /89 blood and 18 and 13/54 tissue cultures, respectively) were most frequently detected.

55 (57%) of patients required surgery and all received antibiotic treatment during hospitalisation, while 88 (91%) continued antibiotics at discharge from hospital. Median duration of hospitalisation was 9.5 days (range 2-101 days) and no fatalities occurred.

### Discussion

Pyomyositis is a rare but potentially serious disease; our preliminary results show that it usually affects primarily healthy children at any age. Clinical presentation is unspecific thus rendering the diagnosis challenging. Treatment regimen and duration vary highly between patients. Summarizing them could help to guide treatment decisions in children with pyomyositis in the future.

P 51

## What influenza can do to you - a case of Horner syndrome after spontaneous pneumomediastinum

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### Introduction

Influenza can cause a variety of complications, including pneumomediastinum. Horner syndrome secondary to pneumomediastinum is a rarely reported constellation. Horner syndrome describes the triad of ptosis (incl. pseudo-enophthalmos), miosis and facial anhidrosis due to an affection of the oculosympathetic chain. Common aetiologies include neuroblastoma, birth trauma, self-sustained or iatrogenic injuries of cervical vessel or nervous structures.

### Case

A 9-year-old girl presented to the pediatric emergency department with fever, dyspnea, hoarseness and worsening of the general condition due to Influenza A. Dyspnea with suprasternal retractions, reduced air entry at the left lung base and spO2 of 94% was noted. Oseltamiflu was started. During the hospitalization, inflammatory parameters (CRP 138mg/l, Leuc 9.2G/L) increased. A Chest x-ray demonstrated a posterobasal infiltrate on the left. With the suspicion of a bacterial superinfected Pneumonia an antibiotic treatment with Co-Amoxicillin was started. A heavy coughing persisted. Cervical skin emphysema was noted on day three after admission. On day four ptosis and mild miosis of the left eye was noted, suggestive of Horner syndrome. Chest CT showed an extensive mediastinal, cervical and thoracic soft tissue emphysema pronounced on the left with extension partly to the intraspinal region. Furthermore, a small pneumothorax on the right side was noted. ENT review, incl. fiber optic inspection, did not reveal any masses or cervical/respiratory injuries responsible for the Horner syndrome. Further monitoring was unremarkable, the emphysema decreased rapidly in size and the Horner syndrome disappeared within 1 week. At outpatient follow up, day 47, the patient had a complete clinical and radiological recovery.

### Discussion

Horner syndrome secondary to mediastinal emphysema is a very rare condition. It is postulated that the oculosympathetic chain is affected by air compression. To our knowledge there is only one further case report in the literature. Also, no further complication and full recovery was noted in that case. With this rare association it is prudent to rule out serious ENT or pulmonary/airway conditions with imaging and fiber-optic inspection.

 

## P 52

### PAEDIATRIC TULAREMIA IN EUROPE – TWO COUNTRIES: DIFFERENT VECTORS AND EPIDEMIOLOGY

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**Background**

Paediatric data on tularemia, an emerging zoonosis, are scarce. In Europe the Francisella tularensis holarctica subtype is primarily responsible for tularemia

syndromes in children. We characterize the epidemiological differences of tularemia in children in Finland and in Switzerland.

**Methods**

We compared datasets from nationwide register-based cohorts from two European countries. Paediatric data (<15 years of age) from 2004-2021 were retrieved from the Swiss (CH) and Finnish (FI) national public health surveillance reporting systems, including a cohort from the Oulu catchment area, a tularemia hotspot in Finland.

**Results**

We recorded 497 (343 FI; 154 CH) cases, 40% (N = 201) of cases were in females. Main vectors were ticks in CH and mosquitoes in FI. In FI, the highest annual incidence was seen in 2007 with the annual incidences of 10.2 in 0-4y, 10.1 in 5-9y, and 8.2 in the 10-14 year age groups. In CH, the annual incidence increased from 0 to 1.7 per 100 000 per year for the <15y age group. In FI,outbreaks occurred regularly every few years, whereas a steady increasing annual incidence was observed in CH. In FI infections peaked in late summer (August and September), while CH recorded two epidemiological peaks (June to July and October). In both cohorts the most common clinical manifestations were ulceroglandular or glandular tularemia followed by rare oropharyngeal, pulmonary, oculoglandular, middle ear, abdominal, and typhoidal manifestations.

**Conclusions/Learning Points**

The CH and FI surveillance cohorts revealed clear differences in the epidemiology of paediatric tularemia, specifically in regards to main transmission vector and incidence peak variation. In CH, the reasons for the observed increasing incidence of pediatric tularemia are unknown and need to be elucidated.

## P 53

### Aren't you too young for appendicitis?

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**Introduction**

Although appendicitis is a frequent cause of emergency surgery in the pediatric population, infantile and neonatal appendicitis are rare (incidence less than 1%) with significant morbidity and mortality. Clinical presentation is aspecific and often includes vomiting, feed refusal, fever and irritability. In neonates, abdominal distension is the most frequent sign.

Diagnosis of infantile appendicitis is a challenge for pediatricians due to its non-specific presentation. The important diagnostic delay explains the high complication rate, along with the anatomical particularities of infant making them more inclined to perforation and rapid extension of infection to the peritoneal cavity. Early recognition and treatment will determine the prognosis.

**Case presentation**

We report the case of a 6 months male infant admitted to Geneva Children's hospital for a fever of unknown origin lasting for 12 days. His parents described an unusual behaviour, reduced mobility (stopped grabbing his feet with his hands in lying position), refusal to get into the prone position and liquid stool for 3-4 days. Initially the fever was attributed to an upper respiratory tract infection.

At admission, physical examination showed right iliac quadrant tenderness. Laboratory blood tests showed elevated C-Reactive-Protein at 157mg/l and high white blood count at 25G/l. Abdominal sonography revealed an heterogenous mass of 7 x 3 cm in the right flank. MRI was performed and aroused the suspicion of collection secondary to perforated appendicitis, although the appendix couldn't be clearly identified. He was treated with intravenous antibiotics (Ceftriaxone and Metronidazole) for 10 days and antibiotics were then continued orally for a total of 2 weeks. Sonographyand biological follow-up showed a rapid improvement during his hospitalisation. An MRI will be performed 3 months later in order to confirm the diagnosis of perforated appendicitis.

**Conclusion**

Acute appendicitis should be included in the differential diagnosis of infants presenting digestive symptoms, irritability and/or prolonged fever. Abdominal sonography should be performed when suspicion is aroused. Early diagnosis and treatment are essential as most cases are already peritoniticwhen diagnosed.

## P 54

### Coronavirus disease 2019, vaccination against coronavirus and immunoglobulin A-mediated diseases: systematic literature review

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**Background**

Coronavirus disease 2019 and vaccination against severe acute respiratory syndrome coronavirus 2 have been associated with autoimmune phenomena. Berger glomerulonephritis and Henoch-Schönlein purpura, two immunoglobulin A-mediated diseases, are often triggered by an infection or a vaccination. However, the interplay between coronavirus disease 2019 or vaccination against severe acute respiratory syndrome coronavirus 2 and Berger glomerulonephritis or Henoch-Schönlein purpura has never been comprehensively investigated.

 

**Methods**

To address this issue, we performed a systematic literature review based on Google Scholar, Excerpta Medica and the United States National Library of Medicine.

**Results**

We sorted out 87 patients with immunoglobulin A-mediated diseases associated with severe acute respiratory syndrome coronavirus 2 infection or vaccination against it (53% males, 47% females; 34 [17-51] years of age, median and interquartile range): 47 cases of Berger glomerulonephritis and 40 of Henoch-Schönlein purpura. Among them, we identified 23 pediatric cases, 10 of Berger glomerulonephritis and 13 of Henoch-Schönlein purpura. Approximately 50% (N = 24) of patients diagnosed with Berger glomerulonephritis and 10% (N = 4) with Henoch-Schönlein purpura had a history of immunoglobulin A-mediated disease in the past. Almost all cases of Berger glomerulonephritis were vaccine-associated (N = 44; 94%), while most cases of Henoch-Schönlein purpura were infection-associated (N = 23; 57%). Among vaccine-associated immunoglobulin A diseases, about 90% were associated to mRNA-based vaccines and, occasionally, they occurred both after the first and second administration.

**Conclusion**

Our analysis supports the hypothesis that severe acute respiratory syndrome coronavirus 2 infection and vaccination against it may trigger or exacerbate an immunoglobulin A-mediated disease.

Bronz G, Faré PB, Lava SAG, Bianchetti MG, Simonetti GD, Scoglio M, Beretta-Piccoli BT, Agostoni C, Milani GP. Coronavirus disease 2019, vaccination against coronavirus and immunoglobulin A-mediated diseases: systematic literature review. J Autoimmun 2022;132:102899. doi: 10.1016/j.jaut.2022.102899.

## P 55

### Correlations between magnetic resonance imaging, gait analysis and anamnesis of patients with cerebral palsy

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**Background**

Limitation in the ability to walk is one of the most disabling consequences in patients with cerebral palsy. In the perinatal period and up to the age of two years malformations, infections, bleeding or trauma can lead to different kinds and dimensions of brain lesions. Movement, posture and balance of these patients are affected in different severities due to different extends of brain lesions. With growth these children often develop contractures and an abnormal gait. Most patients undergo numerous therapies and interventions to achieve a better mobility in everyday life.

**Objective**

The aim of this retrospective study is to find correlations between data from magnetic resonance imaging, gait analysis and the anamnesis of patients diagnosed with cerebral palsy to investigate if there are possible reference points for early prediction of the expected gait disturbance in the future.

**Method**

Included in this project are patients diagnosed with cerebral palsy who are registered in the Swiss Cerebral Palsy Registry. The brain MR images are uniformly evaluated and classified. Detailed perinatal data is gathered from archive reports and is quantified. The included patients underwent a gait analysis where the joint angles and forces were measured over many gait cycles. Also the general degree of joint mobility was evaluated. It is made sure, that no significant orthopaedic surgery was done prior to the gait analysis. The earliest gait analysis is used for the project to ensure the most original state of gait.

**Results**

Preliminary data shows that a quantitative gait description and a detailed mri description shows crucial information what to expect in neonatal brain lesions. At the SGP we will show the complete data analysis of the project.

**Conclusions**

Modern gait analysis offers no insights into the pathophysiology of cerebral palsy.

## P 56

### Striking clinical and imaging similarities between glutaric aciduria type 1 and Aicardi-Goutières syndrome due to homozygous RNASEH2B pathogenic variant: a report of 3 cases

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A 11-month-old boy with good initial psychomotor development was admitted for subacute neurodevelopmental regression following a febrile illness. On examination he was irritable, unable to babble nor sit, exhibited severe axial hypotonia and dystonic posturing of 4 limbs. Eye contact and movements remained unaffected. Initial MRI revealed global atrophy, abnormal signal intensity in basal ganglia and white matter rarefaction. The clinical picture was surprisingly similar to another child's, who was hospitalised during the same period for respiratory distress.

This 4-year-old female was a refugee patient from Syria with GA1 confirmed by biochemistry and genetic evaluation in Lebanon. Unfortunately she could not receive the appropriate diet at that time. After an initial normal development she showed a regression of her motor skills at 6 months, following a febrile infection, with loss of head control at 14 months. On first evaluation in Switzerland at four she had axial and proximal peripheral hypotonia, hypertonia of extremities and absence of any voluntary movements, initially thought to be related to advanced stage of the untreated disorder. It was later discovered that she also had a severe bulbomedullary myelopathy and atlantoaxial instability which worsened her clinical picture. Brain imaging was surprisingly similar with abnormal signal and atrophy of basal ganglia, rarefaction of supratentorial white matter and a thin corpus callosum. She ultimately passed away. Her 2-year-old brother had a milder phenotype with dystonic posturing and axial hypotonia but unaltereded voluntary movements.

Because of the striking similarities between our case and these two siblings, thorough metabolic and genetic investigations were undertaken and a poor lysine diet with carnitine supplementation was started pending results. Metabolic investigations failed to confirm GA1. Whole exome sequencing revealed a homozygote variant of the RNASEH2B gene compatible with AGS. Repeated MRI and brain CT-scan revealed striatal calcifications. Interferon signature was positive. Patient was started on Janus kinase 1 blockade and oral steroids and is currently stable.

 

These two pathologies are uncommon in our everyday practice. One must be aware of their clinical and radiological similarities. Being a treatable disorder when promptly recognised, GA1 must be considered in infantile onset encephalopathy with dystonia. Predominant basal ganglia manifestations expand the phenotype spectrum of RNASEH2B-related AGS.

## P 57

### Cystic Fibrosis Care in Children with Autism Spectrum Disorders: Case Reports and Key Strategies

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**Background**

Patients with autism spectrum disorders (ASD) present a wide range of social and sensorial atypicalities, which represent an obstacle to the optimal care of co-existing health conditions. Cystic fibrosis (CF) is a multisystemic chronic disease requiring a life-long, cumbersome therapy. When a child has both CF and ASD, not only the parents have to cope with two life-changing diagnostics but also the medical team has to revise the applicability of therapeutic standards. To this day, there has been few research about this problematic and there are no recommendations for the care of this rare and vulnerable population of patients.

**Aims**

Firstly, to highlight recurrent obstacles in the CF trajectory of children with ASD. Secondly, to propose leads to help health providers optimize the care of these patients.

Methods: We performed a literature review on PubMed with a combination of the key words “cystic fibrosis”, “autism spectrum disorder”, “chronic disease”, and/or “neurodevelopmental disorder” between 2020 and 2021. We then described the cases of four paediatric patients diagnosed with CF and ASD. We used medical records for patients 1 and 2 followed at the CHUV Lausanne, and information given by the parents per email for patients 3 and 4 followed at the CHU Sainte-Justine-Montreal-Canada. We conducted one-hour semi-structured interviews with the mothers of these patients, following a previously established questionnaire about challenges and facilitators.

**Findings**

All four patients encountered difficulties in their CF trajectory, regarding daily medication, physiotherapy, diet, physical examinations, outpatient consultations and/or hospitalizations. The medical team could not strictly respect the standards of care for CF and had to implement individual solutions in collaboration with the families. Investigating the child’s sensory profile, communicating in a concise, visual way and offering predictability are core principles.

**Conclusion**

Due to their sensorial and communicational issues, autistic children face recurrent obstacles in the management of CF. Health providers have to be better prepared to the specific constraints of both CF and ASD. Since every autistic person is unique, dialoguing with the parents is key in understanding the child’s individual needs and limits and durably maintain adherence.

Keywords: autism spectrum disorders, cystic fibrosis, chronic disease, case reports, strategies for medical teams

## P 58

### Gradenigo Syndrome - a rare complication of acute otitis media not to miss

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**Background**

Acute otitis media is a condition commonly treated in the Pediatric ER. Complications arising from acute otitis media are rare, especially in the post-antibiotic era; an example is the Gradenigo Syndrome. This syndrome is classically described as a triad of otitis media, facial pain and abducens palsy; some cases also describe paralysis of the VII and VIII cranial nerves. Bacteria, mainly S.Aureus and S.Pneumoniae, may travel from the middle ear to the mastoid air cells and then spread to the adjacent petrous temporal bone, around which are located many key structures including the trigeminal ganglion and the abducens nerve, separated from the petrous bone only by dura mater.

**Case Study**

An 11-month-old infant and a 5-year-old child, with no significant past medical history presented to the ER with right acute perforated otitis media for more than a week. Both had a right abducens palsy, the 5-year-old child had also peripheral palsy of the facial nerve with incomplete closure of the right eye (House Brackman V). For both cases, after setting appropriate endovenous antibiotic therapy, brain MRI was performed. MRI of the 11month old showed mild enhancement of the apices of the petrous parts of the temporal bone, and significant mucosal enhancement at the bilateral oto-mastoid cavities, while that of the latter showed petrous apicitis and mastoiditis. Bilateral paracentesis with placement of transtympanic drains was performed in both children. The older patient also underwent right mastoidectomy. The children’s condition improved gradually and after a two-month neuropediatric and ENT follow-up, complete resolution of the nerve palsies and normal hearing bilaterally were observed.

**Conclusion**

Since acute otitis media is one of the main reasons for a presentation in the Pediatric ER, it is important to recognize the signs of neurological complications. As for Gradenigo Syndrome, a prompt intervention can prevent permanent nerve damage and improve outcome.

## P 59

### When an early morning consultation can delay a diagnosis !

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Congenital myasthenic syndromes are rare genetic diseases affecting the neuromuscular junction, responsible for ocular, bulbar, and limb weakness with diurnal fluctuations of symptoms. Due to these fluctuations and variable course, diagnosis can be challenging and delayed. We present the case of a 5-year-old girl with presumed benign infantile hypotonia. Generalized hypotonia and head-lag were noted at birth, with normal metabolic workup and no Prader-Willy syndrome in initial genetic workup. Following spontaneous and rapid improvement, the baby was discharged at day 8 without further investiga-

 

tions. At 12 and 24 month neurology followup, each early morning appointments, neurological examination was remarkable for mild gross motor delay and persisting low tone in the extremities, with normal muscle strength and reflexes. The child was readdressed at age 5 for intermittent bilateral ocular ptosis, evening fatigue and significant head drop during intercurrent illnesses. On examination, this time in late afternoon, bilateral ptosis with a positive Simpson test was evident. Auto-immune forms of myasthenia were also excluded. Suspecting a congenital myasthenic syndrome, further genetic testing was carried out. A homozygous pathogenic variant in the RAPSN gene was identified, which codes for a complex of proteins within the post-synaptic membrane of the neuro-muscular junction, causing a congenital myasthenic syndrome. Symptomatic treatment by pyridostimine was started, with significant improvement. Overnight home polygraphies were carried out as excessive nighttime snoring was reported, to investigate obstructive apnea enhanced by oropharyngeal muscle weakness. These demonstrated a pathological apnea/ hyponea index, with drastic improvement with evening dose of pyridostigmine before sleep. Treatment plan was modified, including a bedtime dose. Children with this disorder can exhibit striking hypotonia and feeding difficulty at birth, respiratory distress and even arthrogryposes. The clinical evolution is generally spontaneously favorable, except during infections when typical head-drop can be noticed. Here we report the case of a child affected by a mild form of congenital myasthenia, with fluctuating head drop and palpebral ptosis that showed significant diurnal fluctuations. Atypical features should lead to reconsider potential causes, including congenital myasthenia syndrome. Overnight polygraphy should be included in the work-up of these patients.

## P 60

### Pineal apoplexy: an interesting and unusual clinical presentation in a pediatric patient.

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**Background**

Pineal apoplexy is a very rare medical condition characterized by sudden neurological symptoms due to a hemorrhage in the pineal gland, most commonly associated with a pineal cyst or tumor. The best known clinical features include headache, nausea or vomiting, visual field defects and gaze paresis, syncope and ataxia, due to associated hydrocephalus. It is most seen in women in the third decade of life.

**Case report**

A previously healthy 15 y.o. boy was taken to the E.R. by ambulance with the aim of a child-psychiatric evaluation, with a history of headache, dizziness, loss of appetite, sleeplessness for three days and depressive symptoms with concern about his mental health, guilt, feeling of inadequacy and suicidal thoughts for a month. During the clinical examination, he was sleepy but arousable and showed a psychomotor slowing with no other neurological signs. The remaining physical examination was normal. The patient was evaluated in interprofessional collaboration between a pediatrician, a child psychiatry and neuropediatrician. He underwent blood tests and toxicological screening which were normal. To rule out an encephalopathy, an EEG was performed showing a slowing of the background rhythm. A brain MRI showed a volume increase in the pineal gland filled with a levelled content suggesting serum/blood, without hydrocephalus. With a diagnosis of hemorrhagic pineal cyst apoplexy, the patient was transferred for clinical observation to the intensive unit care, and managed conservatively without complications. He gradually recovered fully including a normal circadian rhythm, no psychiatric signs, and absence of underlying pathology on clinical and MR follow-up.

**Discussion**

The headache and the neurological disorders shown by the patient are typical manifestations of pineal apoplexy. The insomnia is a more unusual but known presentation postulated to be secondary to melatonin deficiency, known as one of the potential regulators affecting the initiation and the maintenance of sleep.

**Conclusion**

This case aims at sensitizing on the correct evaluation of non-specific psychiatric symptoms, especially if associated with headache and alertness fluctuation. It is important to perform further investigations to rule out neurological disorders. Pineal apoplexy is a rare condition that needs prompt identification and management to prevent potentially severe complications.

## P 61

### Neonatal seizures and KCNQ2 gene mutation: a **Case report:**

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Neonatal seizures are classified as vascular, metabolic, infectious, malformations of cortical development, part of a syndrome, and genetic mutations. Most commonly, they are caused by infection. Although the genetic causes are seldom, mostly channelopathies with genetic variants in Na+ and K+ channels are described. The following is a case report of a newborn male, born at 38+6 weeks gestation with an APGAR of 8/9/10 and birth weight of 4.06 kg, presenting typical symptoms:

He was brought to the neonatology department because of tachypnea, tenderness to touch, petechiae on the left leg and a positive maternal GBS smear. On arrival, he had his first tonic-clonic seizure, which was self-limiting after approx. 30s and led to a desaturation of up to 45%. Antibiotic and antiviral therapy was initiated in case of possible neonatal infection and stopped after 4d. because of negative blood and CSF cultures. No viruses were detected in liquor, stool or urine (Herpes, CMV and Enterovirus). A cranial ultrasound and MRI of the neurocranium revealed no evidence of a primary intracranial process that could explain the seizures. An EEG performed early and a follow-up showed no epilepsy-type potentials. Congenital metabolic disorders, such as those of amino and organic acids detected in liquor and urine, but also those tested in Swiss newborn screening, as well as pyridoxine-dependent epilepsy, were considered as causes of the seizures but proved unremarkable. Antiepileptic therapy was initiated due to the increasing number of seizures. Initially with phenobarbital, it was later switched to levetiracetam due to persistent seizures. After the switch, the child showed a marked increase in seizures (>20/d) with stereotypic behavior.: initial cry, tonic-clonic seizures (sometimes generalized), apnea and at the end often defecation. Therefore, an antiepileptic therapy with carbamazepine was initiated. Subsequently, the frequency and duration of seizures decreased significantly and ceased completely from day 15 of life. Later, the gene panel showed a mutation in the KCNQ2 gene, which in the aggregate of the findings, most likely caused the baby's symptoms. The child was then referred to a pediatric neurologist for further care, has so far developed inconspicuously, and is still seizure-free on weight-adjusted carbamazepine therapy.

 

In conclusion, knowledge of the typical symptoms possibly related to the gene defect may be useful in starting an effective antiepileptic therapy.

## P 62

### Acute neck stiffness and no fever

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**Introduction**

Acute neck stiffness requires immediate diagnostic workup for meningitis including lumbar puncture. In the absence of fever, differential diagnosis is wide and encompasses infectious, inflammatory, hemorrhagic and ischemic etiologies as well as trauma and space occupying lesions. Lumbar puncture needs to be deferred until space occupying lesions are ruled out. Here we present a case of acute neck stiffness along with focal neurological deficits due to acute transverse myelitis.

**Case**

A 5-year-old fully orientated girl presented to our ER with immobilizing neck and shoulder pain, weakness of the upper right extremity and oliguria. Medical history was negative for fever and trauma. Two weeks prior she suffered from gastroenteritis and reported a combined vaccination against diphteria, pertussis and tetanus. Neurological examination revealed marked neck stiffness, weakness in the right hand and arm (M 3/5) and inability to walk. Laboratory work-up including BGA, hemogram, CRP, liver enzymes, kidney parameters and hemostasis was noncontributory. Spinal MRI showed a highly edematous medulla cervical and upper thoracic, suspicious of longitudinally extended transverse myelitis. Due to the medullary edema, lumbar puncture was deferred, and high dose Methylprednisolone (30 mg/kg/day for 5 days) followed by an oral prednisone taper according to the Swiss Consensus statement. Urinary retention required installation of a urinary catheter for 24 hours. Follow-up MRI 4 days after start of anti-inflammatory treatment revealed receding spinal edema and csf-analysis was performed, showing normal cell count, glucose and protein. Serological IgM for B. Burgdorferi was positive. However, there was no sign of a central-nervous immune response to B. Burgdorferi with L/S Index <1.5 and CXCl13 <20 pg/ml. Anti-NMO/Anti-MOG antibodies rheumatological parameters and repeated Lyme serology were negative. Fortunately, the patient showed full recovery within 4 weeks after symptom onset.

**Discussion**

ATM is a rare and potentially life-threatening inflammatory CNS disease in children, encompassing infectious/parainfectious, autoimmune, and vasculitic diagnosis. Immediate neuroradiological and laboratory workup along with timely initiation of anti-inflammatory treatment is paramount to improve outcome and prevent neurological sequelae. Bladder function needs to be regularly assessed as it might require early catheter intervention as shown in this case.

## P 63

### Neonatal Sinovenous Thrombosis – a (not so) rare finding.

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Cerebral sinovenous thrombosis (CSVT) is reported to be a rare finding in neonates with suggested incidence of 2.6 to 12 per 100'000. It is associated with high morbidity and mortality. Since treatment is availabe, timely diagnosis is crucial.

**Objective**

We reviewed the neuroimaging of three cases of symptomatic neonatal CSVT at our clinic in the past five years (2018-2022). Two of the patients were born preterm, one patient was born at term. All three presented symptomatically with seizures, which prompted further imaging. In the two preterm neonates the cerebral ultrasound findings raised suspicion for CSVT, as it showed extensive bilateral hemorrhage with thalamic affection and reduced flow in the cerebral sinuses. In the term neonate, the cerebral ultrasound showed no anomalies. Diagnosis of CSVT was confirmed by MRI and in one patient by additional CT the day following the clinical suspicion. All three babies presented with extensive thrombosis of the deep cerebral venous system and two of them with additional thrombosis of the superficial sinuses. In all three patients, treatment was initiated.

**Discussion**

All three babies presented initially with subtle symptoms and developed seizures which prompted cranial ultrasound. Both patients with ultrasounds revealing hemorrhage also showed reduced venous flow in doppler. The MRI confirmed thrombosis of the respective sinuses and showed additional findings in all three cases. Further imaging was crucial especially for visualization of the extent of thrombosis in the deep venous system.

**Conclusion**

Cranial ultrasound findings of unilateral thalamic hemorrhage as well as extensive bilateral hemorrhage in neonates should raise suspicion for CSVT and prompt further evaluation by MRI. Since especially in preterms, clinical symptoms can be subtle and a considerably high rate of CSVT in asymptomatic preterm neonates has been reported, cranial ultrasound with color doppler may be used as a valid first investigation tool, if done in a standardized manner.

## P 64

### Langerhans cell histiocytosis: A case report in a 5-year-old child

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**Background**

Langerhans cell histiocytosis (LCH) is a rare and poorly known histiocytic disorder with a higher incidence in children compared to adults. Due to the variability of its signs and symptoms it can be either misdiagnosed or the diagnose is delayed. LCH is classified as unifocal or multifocal. Unifocal bone lesions have the best prognosis and are usually managed by conservatively or by local excision, curettage, steroid injection or radiation therapy.

 

**Case report**

We report a 5-year-old boy presenting with pain in his left hip lasting 2 weeks and was diagnosed with unifocal Langerhans cell histiocytosis. The initial x-ray performed was interpreted as normal. In view of clinical deterioration with a limp on the left leg, a 2nd front pelvic X-ray was ordered, it revealed an osteolytic lesion of the left ilio-pubic branch, confirmed by MRI and CT scan. The diagnosis of LCH was confirmed by histological examination of biopsy material. Screening for other locations was unremarkable. As per guidelines, the unifocal, unisystemic bone form does not require any treatment. The child is under close clinical surveillance with good prognosis and no recurrence to date.

**Conclusion**

LCH along with osteomyelitis and Ewing's sarcoma should be considered in the differential diagnosis in children presenting with lameness and radiologic osteolytic lesion.

## P 65

### Hip Pain with Limping in a 7-year-old boy. Osteoid Osteoma of the femoral neck, a case report.

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A 7 years old boy presented with right hip pain and limping for 2 weeks, after minor trauma and common cold a week earlier. History revealed nocturnal wakening due to pain and a tick bite two years earlier. Clinical status showed right hip restriction of internal and external rotation associated with limping. After initial hip and pelvis radiography, the first diagnosis was toxic synovitis. He was started on oral ibuprofen® for 5 days, without symptoms relief. Blood screening with hemogramm, CRP, VS, ASLO, search for Kingella kingae and Lyme serologies were negative. Hip centered ultrasound excluded effusion, but the MRI evoked osteitis. Co-amoxicilline therapy (80mg/kg/day for 5 days) did not bring any improvement. A month after symptoms start, a CT-scan was performed and allowed the diagnosis of Osteoid Osteoma of right femoral neck. Combination of codafalgan® and aspirin®, was successful on pain control. He was finally treated by radiofrequency ablation. Osteoid osteoma is a painful, benign and common bone tumor that may be difficult to diagnose because of atypical presentation. It is a diagnosis we should be aware of, as paediatrician, because most of cases occur between 10 and 20 years of age. Its typical manifestation is bone pain worsening at night, usually relieved by nonsteroidal anti-inflammatory drugs and salicylates. Imaging commonly reveals a lytic lesion, bone sclerosis, cortical thickening and surrounding marrow edema. CT is the modality of choice for diagnosis of Osteoid Osteoma. Radiofrequency ablation is the gold standard treatment.

## P 66

### Identification of new therapeutic targets by arrayed CRISPRa-based approach to map radioresistance in DMG

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Pediatric Diffuse Midline Glioma (DMG) is amongst the most aggressive childhood brain tumors. The dismal prognosis is less than a year for children diagnosed. Radiotherapy (RT) remains the only standard treatment that provides only transient relief of clinical symptoms of DMG patients. Poor survival is associated with radio-resistance due in part to P53 mutational status and to invasive tumor properties related to epigenetic dysregulation. Over 80% of DMG patients harbor oncohistone 3 mutations (H3K27M) leading to global genome hypomethylation and transcriptional disruption. Transcriptional factors are known as master regulators of the genome but their implication in response to radiation treatment remains unclear.

We developed an arrayed-CRISPR screen strategy to understand the role of transcription factors in radioresistance mechanisms in DMG-patient-derived cells.

We performed arrayed-CRISPRa screening in multiwell plates with DMG cells expressing the dCas9-VP64, infected with gRNA lentiviral library to target each transcription factor (one transcription factor overexpressed per well). Each plate was irradiated fractionally (2Gy/day) and after irradiation stopped a comparison between cells overexpressing one targeted transcription to internal controls (non-targeted-gRNA infected cells) has been conducted. Transcription factor "hits" identification is based on Log2FC (logarithm 2 fold-change) with a value higher than 0.6, considering these targets as potentially involved in DMG cell radio-resistance and/or proliferation mechanisms. We identified 82 "hits" with more than 30% described as involved in radio-resistance mechanisms and/or tumorigenesis process, sustaining our screen results. We focus on "hits" with a Log2FC higher than 1 to identify the most robust targets playing a role in resistance to radiation. Currently, DMG cells are being treated with RT in combination with pharmacological inhibitors to validate our candidate target involvement in DMG radio-resistance. Our goal is to achieve a better understanding of resistance mechanisms to identify therapeutic treatments to combine with radiotherapy to overcome radioresistance developed by DMG cells.

 

## P 67

### Mapping tumor microenvironment using emerging technologies for pediatric brain cancers

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Diffuse midline glioma (DMG) is a fatal childhood brain cancer with a survival rate of less than one year from diagnosis. Pharmacological approaches as well as immunotherapy have failed to make a clinical impact. Incomplete understanding of the tumor microenvironment (TME) and tumor associated antigens have contributed to the observed poor prognosis. We hypothesize that characterization of the DMG TME will identify biology-informed targeted treatments. We thus obtained postmortem specimens from 70 patients diagnosed with brain cancers, including 50 DMGs, 20 other types and 10 non-CNS-cancer patients. Up to four anatomical brain locations were selected including the primary tumor, metastatic and adjacent healthy sites. Formalin-fixed-paraffin-embedded (FFPE) specimens were processed for constructing a tissue microarray (TMA). The TMA was stained for a number of markers (H&E, H3K27M, H3K27me3, KI67) and was scored by a neuropathologist. We then used a multiplexed immunofluorescence (MxIF) technology, Cell DIVE™, to iteratively probe 33 biomarkers on a single tissue slide, focusing on immune cell type profiling and activation, and histone mutation status. Analysis of biomarker density and spatial relationships are underway. The main expressed immune markers across all patients were CD163, CD68, and CD8. CD8, a cytotoxic T-cell biomarker, was highly detected in pons, cerebellum, thalamus and the frontal lobe (tumor and healthy) of DMG patients and varied according to clinical intervention, including ONC201 treatment. Furthermore, in comparison to other tumors, DMGs exhibited a higher expression of CD3, a T-cell marker, and CD4, a T-helper cell biomarker. Analysis of Iba1, a microglial marker, confirmed a higher difference in microglial activation in primary tumor compared to metastatic and adjacent healthy tissue. In contrast, CD68 was significantly increased in metastatic sites. Analysis is still ongoing. We report establishment of the most comprehensive TMA for pediatric brain tumors, which provides insights into TME comparing critically important clinical variables.

## P 68

### Pediatric Acute Lymphoblastic Leukemia Presenting with Hypereosinophilia and Eosinophilic Pneumonia

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**Introduction**

Acute lymphoblastic leukemia (ALL) is a rare cause of hypereosinophilia (HE). A combination of HE with signs of organ dysfunction is called hypereosinophilic syndrome (HES).

Eosinophilic pneumonia (EP) is a rare disorder, comprised of several heterogeneous diseases, characterized by the accumulation of eosinophils in lung tissue and BAL fluid. It may be associated with peripheral HE and usually responds well to corticosteroid treatment.

**Case report**

A 14-year-old boy presented with HES and lung involvement. An initial chest x-ray revealed bilateral lung infiltrates consistent with pneumonia, but not responding to antibiotic treatment. The BAL fluid contained a preponderance of eosinophils (78%) and a CT scan revealed bilateral alveolar pulmonary consolidations with ground glass opacities, thus rendering the diagnosis of EP.

A decreased platelet count, mild microcytic anemia and a progressive HE in the absence of other cellular morphological abnormalities was observed in the peripheral blood count.

The differential diagnosis is broad and ranges from reactive changes in the context of infections, intoxication and allergies to myeloid neoplasms and neoplasms with secondary HE.

The first bone marrow biopsy ten days after the disease onset revealed a reactive bone marrow with marked eosinophilia (30%). In the second bone marrow aspiration eight days later infiltration with 86% of blast cells, with an immunophenotype compatible with B- lymphoid blasts was detected, confirming the diagnosis of pre-B-ALL. Chemotherapy according to the international AIEOP BFM ALL 2017 protocol was initiated, followed by a rapid clinical improvement as well as a resolution of HE.

During the therapy, the patient developed a deep vein thrombosis, consistent with reports from the literature that suggest an increased risk of thrombotic complications in this subset of ALL patients.

The patient responded well to the intensive therapy and is currently undergoing maintenance therapy.

**Conclusion**

ALL is a rare cause of HE, which occurs mostly in male adolescent patients. Peripheral HE often precedes the appearance of leukemic blasts, and frequently no blasts are seen in the peripheral blood at all. In case of unexplained HE, a neoplastic cause should be considered and investigated with a bone marrow biopsy.

HE in ALL is a reactive paraneoplastic phenomenon and might be associated with an increased risk of complications and poorer outcomes, largely due to the organ damage as a result of HES.

 

## P 69

### The role of FOXO3 in DMG resistance and response to therapies targeting DMG metabolism

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Pediatric diffuse midline gliomas (DMGs), including diffuse intrinsic pontine glioma (DIPG), are the most difficult childhood brain cancers to treat, with an overall survival rate of less than 12 months from diagnosis. Despite the H3K27M mutation being the main tumor driver, activation of the PI3K/Akt pathway also occurs, altering cancer cell metabolism, increasing glycolysis, and proliferation.

Our research aims to understand the underlying mechanisms of resistance to therapies targeting DMG metabolism and to develop more effective treatment strategies. We have studied the effectiveness of ONC201 in targeting DMG cancer metabolism through mitochondrial degradation, reactive oxygen species increase, and oxidative phosphorylation impairment. Our findings suggest that despite promising results in patients, DMG tumor cells switch to glycolysis after treatment through activation of the PI3K/Akt pathway, which contributes to chemoresistance.

We have found that the FOXO3 transcription factor plays a crucial role in determining DMG tumor sensitivity to therapy, specifically in the response to combined ONC201 and PI3K inhibitors. We have shown that FOXO3 activity is abolished via PI3K pathway activation in resistant DMG cell lines, leading to cytoplasmic translocation and tumor cell survival. Additionally, we found that the expression of FOXO3 is dysregulated in DMG patient tumors. Our data implies that a failure of FOXO3 to reach the nucleus may be a contributing factor to the inadequate response seen in certain ONC201 treated DMG patients.

By utilizing CRISPR-modified patient-derived DIPG cells in vitro, we investigated the impact of FOXO3 knockout/overexpression on tumor sensitivity to various treatment regimens. We have validated new PI3K inhibitors and FOXO3 activators as potential therapeutic strategies for DMG patients.

Our findings suggest that targeting FOXO family of transcription factors may be a promising approach to improve the efficacy of metabolic-targeting therapies for DMGs and ultimately improve the survival of patients diagnosed with this challenging paediatric brain cancer.

## P 70

### Bronchiolitis obliterans: when post-infectious respiratory distress goes on a little too long.

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#### Aim and background

To raise awareness on post-infectious bronchiolitis obliterans (PIBO) as a respiratory complication of bronchiolitis/bronchitis.

PIBO is a rare, chronic irreversible inflammatory obstructive pulmonary disease of the immunocompetent hosts after a respiratory infection, adenovirus being the most common causative pathogen.

#### Case report

A previously healthy 3 years old boy was addressed to the emergency for the fourth event of respiratory distress in a month. He presented with a severe respiratory distress (PRAM score 11), with diffuse wheezing, impaired air entry and desaturation. He was hospitalized 2 weeks earlier during 10 days at the intensive care unit (ICU) for hypoxemic and hypercapnic respiratory failure due to bronchitis and received inhaled fluticasone once a day since. Lab workup showed respiratory acidosis and a positive Rhinovirus nasopharyngeal swab. Following further deterioration, the patient was re-hospitalized at the ICU for high flow oxygen therapy, salbutamol inhalers, intravenous magnesium sulfate and intravenous methylprednisolone. Evolution was unfavorable with an increasing respiratory distress, despite intensification of that treatment. Lung X-ray showed a hyperinflation with bronchial wall thickening. Thoracic CT revealed mosaic pattern with air-trapping, ground-glass opacities, and diffuse bronchiectasis. Bacterial and fungal infections, cystic fibrosis, immunodeficiency and asplenia were excluded. The diagnosis of presumption retained was PIBO. Multiple therapy composed of azithromycin, montelukast and inhaled fluticasone was started, leading to a slowly favorable evolution.

#### Discussion

PIBO should be thought of in case of unexpectedly slow recovery after bronchiolitis/bronchitis. Although formal diagnosis is based on lung biopsy, thoracic CT-scan is useful to characterize parenchymal, bronchial involvement or complications. Pulmonary function tests show characteristic fixed airway obstruction. Detailed history should trace the patient's previous infections, respiratory events, growth, and development. Underlying conditions such as immune deficit, cystic fibrosis and primary ciliary dyskinesia should be excluded.

Epidemic trends of respiratory viruses have changed after the SARS-COV-2 pandemic. Many Europeans centers noticed an upsurge of PIBO cases that might be related to an increase of pulmonary infections since facial masks have been removed.

## P 71

### Multiple breath washout and imaging to detect early pulmonary toxicity in paediatric cancer patients and survivors: first results of a systematic review

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#### Introduction

Conventional pulmonary function tests in asymptomatic patients are not sensitive enough to detect early pulmonary dysfunction after pulmotoxic cancer treatment. Washout tests are more sensitive for small airway disease and imaging can detect structural and functional changes. Their use for early detection of pulmonary dysfunction in paediatric cancer patients remains unknown.

#### Aims and objectives

We investigate the use of washout tests and lung imaging for detecting pulmotoxic treatment effects in children undergoing cancer treatment.

#### Method

We addressed two examination modalities to detect functional and structural lung damage 1.) washout test and 2.) lung imaging.

 

We registered the review in PROSPERO (CRD42022348624) and systematically searched Medline, Embase and Cochrane Library for the period 1995-2022. Two reviewers checked title, abstract, full text, extracted data and performed quality control.

**Results**

For both research questions combined, we identified 6512 studies. We screened 109 full-texts and included 20 publications (7 washout, 12 imaging, 1 with both). From the 8 studies on washout, 4 covered stem cell transplantation (HSCT) patients. Computed tomography images were used in 12 out of 13 studies, of which 9 covered HSCT patients. We did not conduct a meta-analysis because of study heterogeneity.

**Conclusion**

Few studies used washout tests in HSCT and oncology patients to assess pulmonary dysfunction. Lung imaging was mainly done in HSCT patients, using computed tomography. Longitudinal studies, including radiation-free imaging, not only after HSCT but also in childhood cancer patients are needed.

## P 72

### Raised intracranial pressure with bilateral severe papilloedema and squint in a child with cystic fibrosis established on elexacaftor-tezacaftor-ivacaftor modulator therapy

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**Background**

The most recent cystic fibrosis (CF) transmembrane conductance regulator (CFTR) gene variant-specific therapy, elexacaftor-tezacaftor-ivacaftor (ETI) has been the most impactful CFTR modulator therapy to date. In Switzerland, ETI was licensed for children with CF aged 6-11 years in January 2022. Clinical trial data provided reassurance that for most children this triple agent combination is well tolerated and safe.

**Case report**

A 9-year-old boy diagnosed following neonatal surgery for meconium ileus (heterozygous for F508del/Q39X). Good progress on standard CF therapies, including PERT and nebulised hypertonic saline. In July 2022, he had an episode of distal ileal obstruction syndrome (DIOS), which was managed medically as an inpatient. After this hospitalisation, he was started on ETI following a comprehensive review including a normal eye examination and vitamin A levels (1.24 µmol/l; normal range: 0.66-1.70). One month later, his mother reported intermittent headaches for 3 weeks. In mid-September a squint was noticed, and an appointment with the ophthalmologist was made, but not available until 1 month later. In November, he was reviewed, and a right sided 6th nerve palsy diagnosed with bilateral severe papilloedema (BSP). He was then admitted and MRI and CT scans findings were consistent with raised intracranial pressure (ICP). A lumbar puncture (LP) demonstrated a raised pressure of 38 cmH2O and 10ml of CSF was released. The ETI dose was reduced by half and Vitamin A supplements were discontinued because of increasing blood levels (1.69 and 1.82 µmol/l). Acetazolamid was started but there was no improvement in BPS and nerve palsy. Another LP was organised (pressure: 29 cmH2O) and a further 10ml of CSF released. ETI was then discontinued and subsequently, BSP improved significantly, but the 6th nerve palsy remains present.

**Conclusion**

The timing suggests that the raised ICP occurred after starting ETI. Delays in presentation reflected the fact that the family did not perceive this event could be related to CF or the new therapy. Other causes of raised ICP in children have been excluded, including normal or only slightly elevated vitamin A levels. Current guidance states that before commencing ETI, children should have a routine eye examination to exclude lens opacities. It is important that this examination also includes fundoscopy to record normal optic nerve appearances. Eye examination should be repeated 3-6 months after starting ETI

## P 73

### The early life respiratory microbiota as predictor of respiratory health in infants with cystic fibrosis?

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**Background**

Lower respiratory tract infections (LRTI) are a driving factor for pulmonary exacerbations and lung function decline in people with cystic fibrosis (CF), leading to recurrent antibiotic treatment. It was shown that the respiratory microbiota is closely related to the pathogenesis of LRTIs in healthy infants, but data in infants with CF is scarce.

**Objectives**

We aimed to study whether the early-life upper respiratory tract microbiota is associated with the occurrence of LRTIs and frequency of respiratory symptoms in infants with CF compared to healthy controls, also considering antibiotic treatment and other factors possibly associated with LRTIs.

**Methods**

We performed 16S rRNA gene V4 sequencing and subsequent analysis of the respiratory microbiota in biweekly nasal swabs. We included 50 infants with CF and 30 healthy controls from two prospective birth cohorts followed throughout the first year of life. We assessed respiratory symptoms, antibiotic treatment and changes in the environment at time of swab via standardized telephone interviews.

**Results**

We analyzed 1511 time points (963 in CF). The respiratory microbiota differed between infants with CF and healthy controls: relative abundance of Staphylococcaceae was higher (Coef 0.19; p = 0.023) and of Moraxellaceae was lower (Coef -0.29; p<0.001) in CF infants. A lower α-diversity (measured as Shannon diversity index) of the respiratory microbiota was associated with a higher number of LRTIs (Coef -0.42; 95% CI -0.59, -0.20; p<0.0001) in infants with CF. This lower α-diversity was already present before first respiratory symptoms occurred (Coef -0.47; 95% CI -0.82, -0.12; p = 0.01) and associations were robust when stratified for antibiotic treatment. ß-diversity increased after the first respiratory tract infection as a "first hit" in infants with CF compared to healthy individuals (PERMANOVA p = 0.001).

**Conclusion**

A lower α-diversity could indicate imbalanced respiratory microbiota profiles in early infancy, which could predispose to susceptibility towards more frequent LRTIs in infants with CF independent of antibiotic treatment. In addition, an increased ß-diversity after the first LRTI might reflect less stable bacterial networks in infants with CF. A less diverse microbiota in early

 

life in CF could thus play a role in later disease progression. While larger studies are clearly needed, the respiratory microbial diversity might have the potential to serve as a future therapeutic target (e.g. probiotics).

## P 74

### Clinical and molecular characterization of progressive pediatric low-grade gliomas

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#### Background

Pediatric low-grade gliomas (pLGG) are the most common brain tumors in children. Despite having benign features, tumor progression and treatment failure are common. While pLGGs are considered as a "one-hit" disease, with tumor-driving molecular alterations in the Ras/MAPK signaling pathway, a more complex spectrum of alterations may explain progression and treatment failure.

#### Aim

To determine the clinical and molecular risk factors affecting tumor progression in PLGG patients.

#### Methods

Retrospective study of all patients diagnosed with pLGG at our institution from 1990-2022. Clinical data were collected by chart review. Molecular profiling was performed using Foundation One panel analysis. A selected subcohort enriched for paired (therapy-naïve and treated) samples is further analyzed by RNA-seq and whole exome sequencing.

#### Results

We identified 209 patients diagnosed with pLGG. Of those, 62 children and adolescents showed tumor progression during or after treatment, requiring 1-7 lines of treatment including surgery, radiation, chemotherapy (median of 3). Patients with progressive pLGG had a median age at diagnosis of 3.3 years (range 0.3-15.2) vs patients with non-progressive pLGG 7.51 years (range 0.5-16.4). Progressive pLGGs tumor location was in 44% suprasellar/midline, 15% posterior fossa, 13% brain hemispheres, 13% brainstem, 10% spinal, 3% thalamic. The most common histology was pilocytic astrocytoma (63%). Five of 62 (8%) patients with progressive died in a median time of 2.3 years after diagnosis. Metastases were detected in 20% of patients in the progressive pLGG group, whereas in 1% in non-progressive. Molecular profiling uncovered several known pLGG-associated alterations, including BRAFV600E, NF1. Several tumors harbored multiple concomitant alterations within the Ras/MAPK pathway, such as HRAS, PTPN11, CREBBP, FGFR1. Besides the canonical BRAF-KIAA1549 fusion, we also identified several rare gene fusions, including BRAF-FAM131B and RAF1-SRGAP3.

#### Conclusion

We confirmed several clinical risk factors associated with progressive pLGG, including young age, midline tumor location, and presence of metastatic disease. Molecular profiling of patients with progressive pLGG reveals an heterogenous landscape of alterations, which can be explored for co-targeting treatment strategies.

 

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