Peer reviewed article

Mycobacterium bohemicum – a cause of paediatric cervical lymphadenitis

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Summary

We report on two toddlers suffering from *Mycobacterium bohemicum* lymphadenitis. Acid-fast bacilli were cultured from submandibular lymph nodes and identified by molecular methods as *Mycobacterium bohemicum*. Surgical treatment was successful and complemented by oral treatment with clarithromycin and rifampicin.

Key words: Mycobacterium bohemicum; lymphadenitis; child; treatment; outcome

Case reports

Case 1

A 3½-year-old girl was admitted to the paediatric department because of right-sided submandibular lymphadenitis that had not responded to oral amoxicillin and clavulanic acid. An intracutaneous Mantoux test with 2 units of purified protein derivative RT23 (Statens Serum Institut, Copenhagen, Denmark) resulted in a palpable induration of more than 2 cm in diameter. The girl was otherwise healthy without any symptoms suggestive of active tuberculosis such as weight loss, sweating or decreased appetite, and there were no such symptoms among family members. Her chest x-ray was normal and she had never been immunized against tuberculosis. Sonography of the lymph node did not show liquefaction or calcification. The lymph node was surgically removed and histological examination demonstrated granulomatous and necrotising inflammation.

Case 2

A 2-year-old girl was admitted with a 2-week history of right-sided cervical lymphadenitis not responsive to treatment with amoxicillin and clavulanic acid for 12 days. She was otherwise healthy. She and her family had no symptoms suggestive of active tuberculosis but 13 years before a cousin was diagnosed as having cervical lymphadenitis caused by nontuberculous mycobacteria. The girl was afebrile and presented with a firm, submandibular lymph node sized 5 × 3 cm. Laboratory investigations revealed an elevated ESR of 45 mm/h, normal CRP values and a peripheral white cell count of 12.4 × 10^9/L with a normal differential. Repeated sonography of the lymph nodes showed increasing liquefaction. Chest x-ray and Mantoux test were not performed in this patient. Rapidly progressive cervical abscess formation accompanied by diffuse tissue inflammation led to biopsy and incision with drainage. Under these circumstances total excision of the enlarged lymph nodes was not possible.

Microbiology

A direct smear of the lymph node specimens was positive for acid-fast bacilli in both cases. After homogenisation and decontamination with sodium dodecyl sulfat-NaOH, aliquots of the biopsy specimens were inoculated onto a Lowenstein-Jensen slant, a Middlebrook 7H11 and 7H12 agar plate, and into a vial of the BacT/ALERT 3D system (BioMerieux Inc., Durham, NC). Acid fast bacilli (1+ and 2+ respectively) were detected by screening smears stained with auramin-rhodamin and confirmed by Ziehl-Neelsen staining. PCR for *Mycobacterium tuberculosis* complex with the COBAS AMPLICOR System (Roche Molecular Diagnostics, Basel, Switzerland) was negative in both cases. Growth was detected after eight weeks and ten weeks respectively in the BacT/ALERT vials. In case 1 a scotochromogenic mycobacterium grew on the Lowenstein-Jensen slants. Partial sequencing of the 16S ribosomal RNA gene was done with the MicroSeq 500 16S rDNA Bacterial Sequencing Kit (Applied Biosystems, Foster City, CA). Comparison of the sequence with the MicroSeq database and the RIDOM [1] database gave a perfect match (100%) with *Mycobacterium bohemicum* in both cases.

We initiated supportive treatment with clarithromycin and rifampicin for 4 months in case 1, because lymph node excision was suspected to be incomplete. Wound healing was uncomplicated. In case 2, clarithromycin and rifampicin were administered for 6 months because of the slow regression of local symptoms when evaluated after 4 months of antibiotic treatment. Improvement was slow but finally, after 6 months of antibiotic treatment, involution of the lymph node and uncomplicated scarring of the skin occurred.

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Discussion

Mycobacterium bohemicum is a novel mycobacterial species characterised by a unique 16S rDNA nucleotide sequence [2] and has only recently been recognised as a cause of nontuberculous mycobacteriosis in children [3]. It has been isolated from human, veterinary, and environmental sources, eg, water streams containing high amounts of organic matter [4]. Apart from our patients, *Mycobacterium bohemicum* has only been reported as a cause of cervical lymphadenitis in two Italian children and one Swiss child [3, 5, 6]. By presenting these two further cases we would like to draw the attention to this potentially emerging nontuberculous mycobacterium as a cause of cervical lymphadenitis in children.

Because its phenotypic characteristics closely resemble those of *Mycobacterium scrofulaceum*, *Mycobacterium bohemicum* can be easily misidentified if the microbiological diagnosis is based on biochemical and cultural features only. As suggested by Tortoli and colleagues [5], *Mycobacterium bohemicum* may therefore be a much more common cause of cervical lymphadenitis due to "mycobacterium other than tuberculosis" (MOTT)-infections in children. PCR-based sequence analysis of the 16S rRNA gene as used for the effective differentiation of other mycobacterium species [7] safely identifies *Mycobacterium bohemicum* [2].

Surgical excision was performed in all previously reported cases. We elected to treat our patients with a combination of clarithromycin and rifampicin for 4 and 6 months respectively, because complete lymph node excision could not be assured by the surgeon in case 1 and was impossible due to diffuse tissue inflammation and abscess formation in case 2. Official recommendation for treating paediatric MOTT lymphadenitis is total lymph node excision. Additional administration of oral antibiotics such as clarithromycin, or azithromycin combined with rifampicin or rifabutin is recommended only for persistent fistulae or subtotal lymph node excision [8, 9].

In summary *Mycobacterium bohemicum* should be added to the list of species that induce paediatric cervicofacial MOTT infection and may be more common than previously reported. Sequence analysis of the 16S rRNA gene is recommended to safely identify *Mycobacterium bohemicum*. Treatment following guidelines for paediatric MOTT lymphadenitis is effective and based on total lymph node excision with or without supplemental antibiotic long term treatment.

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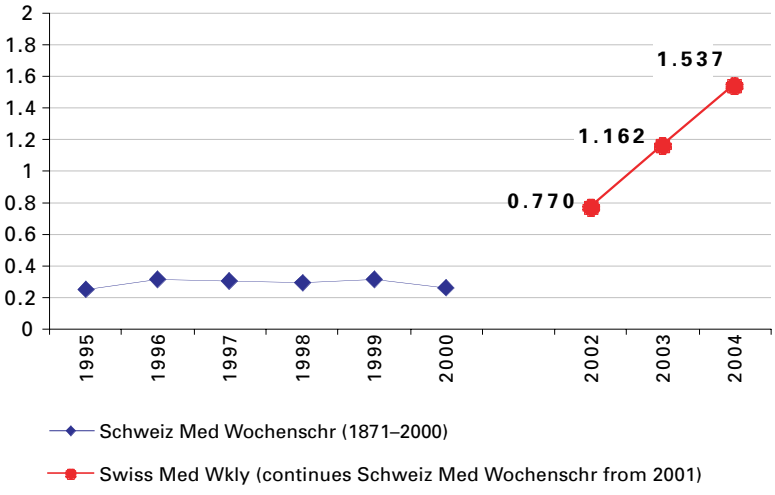

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