Peer reviewed article

Women's experiences with low-risk singleton in-hospital delivery in Switzerland

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Summary

Objective: To assess maternal and neonatal clinical short-term outcomes and women's experiences with singleton low-risk in-hospital deliveries in a routine care setting.

Methods: In 13 community hospitals in the Cantons of Zurich (10), St. Gallen (2) and Schwyz (1), participating in the "Canton of Zurich Outcomes Project", trained hospital staff recorded clinical outcome data. Patients completed a questionnaire at the end of the hospital stay. Over two measurement cycles, 3395 eligible women entered the study and 2079 (61%) returned the questionnaire.

Results: Sixty-seven percent of women had spontaneous and 11% had assisted vaginal deliveries, 12% delivered by emergency, and 10% by elective Caesarean section. The episiotomy rate in vaginal deliveries was 46% (95% CI 44–48%). Ten percent of neonates had umbilical cord artery pH ≤7.15 (95% CI 9–11%) and Apgar scores at five minutes were ≤7 in 3% (95% CI 2.5–3.6%). Reporting negative experiences with hospital care and an insufficient state of knowledge at discharge were strongly associated with mode of delivery. The top three issues new mothers were most likely to report about feeling little or not informed about were postpartum pelvic floor exercises (22%), management of vaginal bleedings (12%), and alternatives of infant feeding (10%).

Conclusion: In a setting of routine care poor short-term outcomes were rare in women giving birth in hospitals, and neonates and most mothers were discharged with a level of information that at least ensured a smooth transition to follow-up maternal care. Poor clinical results and patient-reported negative experiences concentrate in few individuals. Restrictive approaches that reduce the frequency of instrumental vaginal delivery, and routine episiotomy remain an important objective for quality improvement.

Key words: quality indicators; quality of health care; outcome assessment; childbirth; patient education; infant care

Introduction

The Health Authority of the Canton of Zurich, which serves a population of about 1.2 million citizens, initiated a comprehensive quality improvement project in 1996 [1]. The main objective was the development, measurement, and implementation of meaningful indicators for routine assessment of hospital quality of care. In brief, representatives of pilot hospitals, the health authority, and external experts jointly developed outcome indicators in an iterative, Delphi-like procedure. Indicators were included if they were accepted by all participants. After extensive testing and adoption, outcome indicators are now measured in routine care and participating hospitals benchmark their results.

"*Low-risk*, *in-hospital singleton delivery*" is one of the tracer conditions for which outcome indicators were developed. Serious complications and poor medical outcomes are fortunately rare in these patients. However, with decreasing length of stay, the provision of individual, appropriate and patient-oriented care, and postpartal support remain a challenge for midwifes, nurses and obstetricians. Mothers have strong information needs postpartum, and prenatal education cannot completely meet these needs prospectively [2, 3]. Active participation in decisions regarding the interventions to be performed during delivery (e.g. Caesarean section) depends on a variety of factors such as the urgency of the situation, and cannot always be achieved. Still, the appropriate communication and explanation of the course of delivery

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(at least during the postpartum stay) is of high relevance for integration and positive perception of the childbirth experience [4]. Besides traditional clinical indicators of short-term outcome that measure rather "technical" performance, the developed indicator set therefore focuses important aspects of quality-of-care as assessed by mothers via self-administered questionnaires. As for many European countries, systematic information on health services quality from the patients' perspective is still rare in Switzerland, and to the authors' knowledge this is the first large-scale effort to implement a combination of clinical measures and subjective assessments in routine maternal care. In this study, we report clinical obstetric and neonatal short-term outcomes and mothers' self-reported evaluation of quality of maternal care. We also investigate the relation between clinical outcomes and subjective experiences.

Patients and methods

Patients

Patients were recruited among all the women attending the study hospitals for delivery from January 2000 to May 2000 (first measurement cycle) or from December 2000 to May 2001 (second measurement cycle). Patients were eligible in case of single gestation pregnancies, if they were hospitalised for delivery, defined as at least one overnight stay, and if the newborns' weight was >2500 g. Multiple gestations and low-birth-weight neonates were excluded from observation to increase the fraction of variability in the hospitals' maternal and neonatal outcomes attributable to hospital care, and decrease the effect of differences in patient populations between hospitals.

Setting

Thirteen community hospitals in the Cantons of Zurich (10), St. Gallen (2) and Schwyz (1), including one university hospital, participated in either of the two measurement cycles (6 in the first, and 8 in the second period). The number of beds in these institutions ranges from74 to 965 with a mean of 338 beds. The total number of inpatient births in these hospitals in the respective years of study period was 11 057 annually with a mean of 850 births per hospital. All 13 institutions participate in the comprehensive outcome measurement system, benchmarking, and condition specific professional peer-groups to discuss outcome indicators and measurement results, but the duration of preceding participation differs between hospitals.

Data collection

Hospital staff collected demographic, basic and outcome data via specific data sheets. Each hospital nominated a person in charge for ensuring and supervising correct data collection. Data sheets were completed at discharge and transferred to the "Verein Outcome" office. Women's evaluations of the hospital stay were obtained via self-administered questionnaires, dispensed by hospital staff at the end of hospitalisation. The procedure followed a standardised course that was described and explained in the measurement manuals and exercised in workshops. New mothers received the questionnaire with a covering letter and a reply paid envelope to complete before discharge or at home, and were asked to return the completed questionnaire in the closed envelope to hospital staff or to post it to the specified neutral post-box address. The covering letter informed patients on the usage of their data, the aims of the project and asked for consent. Hospital staff was encouraged to remind new mothers of the questionnaire 12 hours after handout and was advised on appropriate communication and presentation of the questionnaire. In case mothers felt unable to complete the questionnaire alone they were encouraged to ask their companions or, if necessary, the hospital staff to help them. Non-German speaking mothers were offered support by interpreters. Questionnaire versions in the Albanian and Serbo-Croatian languages were available in the second measurement cycle. Questionnaires were quasi-anonymous (coded by code number) and responses were related to clinical data sheets by code number.

Processing and analysing data

Transmitted data sheets were subject to systematic data controlling. They were checked for eligibility, completeness, and a number of plausibility tests consecutively upon arrival. Incomplete or implausible data sheets were returned to the respective hospital with the request to restore the original information (e.g. from medical records). Also, the number of recorded and transferred cases were compared to expected number of cases on an individual hospital level, based on historical data of number of births reduced by approximations of non-eligible cases. Data sheets and questionnaires were scanned and then merged by code number. The official cantonal data protection agency approved data transmission and processing procedures. Due to internal guidelines that prohibit disclosure of hospital specific data to the public, results are pooled over two measurement sequences.

Statistical Analysis

Unpaired t-tests and χ^2 tests were applied to compare responders to the questionnaire to non-responders and to test for differences in clinical outcomes between subsamples. Logistic regression was applied to adjust for the potentially confounding factors age, length of stay (LOS), and presence of any comorbidities as in the calculation of odds ratios (OR). We also calculated a "problemscore" for survey data: For each question, responses were dichotomized as 0 (no problem) or 1 (a serious problem, represented by the least favourable response code) [4]. Patients that reported one or more problems, i.e. scored "1" on any question, were considered to have experienced a hospitalisation "with a patient-evaluated problem". Multiple logistic regression was used to identify risk factors for patient-reported problems while adjusting simultaneously for confounding factors. Confidence intervals are reported at the 95% level. Data were analysed with the statistical software Stata 8 [5].

Results

Clinical outcome indicator data were obtained for 3395 patients of whom 2079 returned the questionnaire (response rate 61%). The mean age of mothers was 30 years and their mean length of stay (LOS) was 6.5 days. Non-responders to the questionnaire were slightly younger than responders

Table 1

Clinical maternal and neonatal outcomes.

Characteristics and outcomes	% of cases (N = 3395)
Maternal age, yr (n = 3395)	
<20	1
20–24	14
25–29	29
30–34	35
≥35	20
Non-optimal obstetric background /Comorbidities (n = 3395)	
None recorded	83
Post Caesarean section state	7
Oligohydramnyos	2
Preterm labour	2
Gestational diabetes	2
Rhesus incompatibility	2
Other[1]	2
Maternal outcome	
Mode of delivery (n = 3395)	
Spontaneous vaginal	67
Assisted vaginal	11
Emergency Caesarean section	12
Elective (scheduled) Caesarean section	10
Perineal laceration (n = 2573)[2]	
Degrees I. and II	30
Degrees III. and IV	2
Episiotomy (n = 2600)[2]	46
Reoperation (including minor surgery subsequent to delivery) (n = 3353)[3]	1
Pyrexia (postpartal temperature ≥38.0 °C on at least two days) (n = 3261)[3]	0.6
Blood loss (decrease in Hb ≥3 g/dl during 72 hours after delivery) (n = 3357)[3]	7
Neonatal outcome	
Birth weight, g (n = 3387)[3]	
2500–2999	16
3000–3499	42
3500–3999	31
≥4000	10
5-minute Apgar (n = 3390)[3]	
0–3	0.32
4–7	3
8–10	97
10-minute Apgar (n = 3392)[3]	
0–3	0.1
4–7	0.6
8–10	99
Umbilical cord artery pH (n = 3319)[3]	
<7.00	0.24
7.00–7.15	10
7.16–7.25	37
>7.25	53

[1] Detailed data recorded. [2] n = non-missing data for vaginal deliveries.
[3] n < N (3395) due to missing data for some subjects.

(29.4 vs. 30.6 years; p <0.000). There were no significant differences in terms of length of stay, presence or number of maternal non-optimal background variables, mode of delivery, and maternal or neonatal outcomes.

Clinical maternal and neonatal outcomes

Some 2640 women had vaginal delivery (78%), and 755 (22%) delivered by Caesarean section (CS) of whom 408 (12% of all deliveries) experienced an emergency CS. The most frequent indications for Caesarean delivery were nonvertex presentation (22%), status post sectio Caesarea (19%), foetal distress (16%), failure to progress (9%), and mother's request (7%). Descriptive and clinical outcome data are summarised in table 1.

Women that delivered by CS (emergency or elective) were at slightly increased risk for experiencing postpartum reoperation, blood loss or pyrexia compared to vaginal delivery (spontaneous or assisted) (adjusted OR 1.5, CI 1.1–2.0). The episiotomy rate was 38.5% (CI 36.5–40.5%) in spontaneous and 91.3% (CI 88.3–94.2%) in assisted vaginal deliveries, and 45.9% (CI 44.0–47.8%) for the calculated overall vaginal deliveries. Adjusted for instrumental vaginal delivery (forceps or vacuum extraction) versus spontaneous delivery, episiotomy was associated with an increased risk for postpartum blood loss (adj. OR 2.6, CI 1.8–3.8) and severe (third- and fourth-degree) perineal laceration (adj. OR 2.3, CI 1.2–4.5) but not with reoperation or postpartal pyrexia. Assisted vaginal (AV) as opposed to spontaneous vaginal (SV) delivery was associated with an increased risk for experiencing any postpartum complication (blood loss, reoperation or pyrexia) (adj. OR 2.4, CI 1.7–3.4). Distribution of Apgar scores at five and ten minutes respectively are presented in Table 1. As compared to SV delivery, AV delivery (adj. OR 3.1, CI 1.9–5.1), and emergency CS (adj. OR 2.0, CI 1.2–3.5), but not elective CS (adj. OR 0.3, CI 0.90–0.97) were associated with an increased risk

Table 2

Summary of responses to individual questions related to Caesarean delivery presented in the questionnaire. Values are percentages of patients to whom the question applied and who answered the question.

Questions related to delivery by Caesarean section only (n = 459)[1]

Q1	**Are you confident, that the decision to have a Caesarean section was right? (n = 445)[2]**				
	Yes, I am very confident	I am fairly confident	I am uncertain	No, I think the decision was wrong	
	88	11	<1	<1	
Q2	**When you first were given the infant during the operation, how convenient was the point in time to you? (n = 207)[2,3]**				
	Too early	Just right	Too late	Much too late	Not applicable[4]
	1	88	3	2	6
Q3	**Did you feel affected by pain as a barrier in establishing contact with your baby during the days after the operation? (n = 440)[2]**				
	Strongly affected	Moderately affected	Little affected	Not affected at all	Not applicable[4]
	8	13	45	31	3

[1] Total number of women that delivered by Caesarean section and returned the questionnaire.
[2] Number of valid responses to this item.
[3] This question was only provided in the second measurement cycle.
[4] Response wording varied with question, e.g. one response to question 2 read "I cannot answer this question, I was unconscious.".

Table 3

Summary of responses to individual questions related to vaginal delivery presented in the questionnaire. Values are percentages of patients to whom the question applied and who answered the question.

Questions related to vaginal delivery only (n = 1620)[1]

Q4	**Do you think that you were sufficiently supported in pain management during delivery? (n = 1564)[2]**				
	Absolutely sufficient	Fairly sufficient	Rather insufficient	Absolutely insufficient	
	82	13	3	1	
Q5	**Are you confident that the decision to have an episiotomy was right? (n = 712)$_3$**				
	Yes, I am very confident	I am fairly confident	I am uncertain	No, I think the decision was wrong	I had no episiotomy
	80	13	3	<1	4
Q6	**Are you informed about intimate area care? (n = 1564)[2]**				
	Yes, completely	Somewhat informed	Little informed.	Not informed at all	
	76	20	3	1	
Q7	**Do you have postpartal pain? (n = 1573)2**				
	Severe pain	Moderate pain	Minor pain	No, not at all	
	8	37	32	23	

[1] Total number of women that had vaginal delivery and returned the questionnaire.
[2] Number of valid responses to this item.
[3] Number of responders to this item that had an episiotomy as indicated by data sheets.

Table 4

Summary of responses to individual questions unrelated to mode of delivery presented in the questionnaire. Values are percentages of patients to whom the question applied and who answered the question.

Questions applying to all mothers (n = 2079)

Q8	**Are you informed about resuming physical activity? (n = 2038)[1]**				
	Yes, completely	Somewhat informed	Little informed	Not informed at all	
	60	32	6	2	
Q9	**Are you informed about which postpartum pelvic floor exercises to do at home? (n = 2048)[1]**				
	Yes, completely	Somewhat informed	Little informed	Not informed at all	
	46	32	13	9	
Q10	**Are you informed about when you may resume sexual activities? (n = 2050)[1]**				
	Yes, completely	Somewhat informed	Little informed	Not informed at all	
	86	9	3	2	
Q11	**Are you informed about what to do in case of vaginal bleeding? (n = 2029)[1]**				
	Yes, completely	Somewhat informed	Little informed	Not informed at all	
	68	20	8	4	
Q12	**Are you confident in taking care of your baby? (n = 2058)[1]**				
	Yes, I am very confident	I am fairly confident	I am uncertain	No, not at all	Not applicable[2]
	66	33	1	<1	<1
Q13	**Are you informed about contraception after delivery? (n = 2028)[1]**				
	Yes, completely	Somewhat informed	Little informed	Not informed at all	Not applicable[2]
	82	11	3	1	3
Q14	**Are you informed about whom to contact should you experience problems or have questions (e.g. mother-child centre)? (n = 2047)[1]**				
	Yes, completely	Somewhat informed	Little informed	Not informed at all	Not applicable[2]
	91	7	1	1	<1
Q15	**Are you confident with breast-feeding? (n = 1908)[3]**				
	Yes, I am very confident	I am fairly confident	I am uncertain	I am very uncertain	
	60	36	3	<1	
Q16	**Are you informed about breast care and what to do should you experience pain in your breasts? (n = 1900)[3]**				
	Yes, completely	Somewhat informed	Little informed	Not informed at all	
	73	25	2	<1	
Q17	**Are you informed about alternatives for infant feeding, apart from breast feeding? (n = 1955)[3]**				
	Yes, completely	Somewhat informed	Little informed	Not informed at all	Not applicable[2]
	42	27	8	2	21

[1] Number of valid responses to this item.
[2] Response wording varied with question, e.g. one response to question 12 read "I cannot answer this question, the infant was transferred.".
[3] Number of responders to this item that stated they can and want to breast-feed.

for 5-minute Apgar scores ≤7. Also, AV versus SV delivery doubled the risk for pH ≤7.15 (adj. OR 2.4, CI 1.8–3.2).

Results of questionnaires

Questions and frequency of responses are provided in detail in Tables 2–4. Women experiencing emergency as compared to elective CS were less likely to feel confident with the decision and reported the first contact to the neonate more often as too late or much too late. Women with SV compared to AV delivery were more likely to report problem concerning postpartal pain, and interpartal pain management.

A reasonable fraction of responders after vaginal delivery did not classify themselves appropriately as either having had an episiotomy or the opposite: 4% of the 712 women for whom an episiotomy was recorded reported that episiotomy had not been undertaken. The majority of these women (73%) also did not experience perineal lacerations. On the other hand, 11% of women in which no episiotomy was performed evaluated the decision to undergo episiotomy in the questionnaire.

Among the questions unspecific to mode of delivery (Table 4), the top three issues new mothers were most likely to report as feeling little or as not at all informed were postpartum pelvic floor exercises (22%), management of vaginal bleedings (12%), and alternatives of infant feeding (10%).

Multiple logistic regression shows that reporting at least one serious problem (problemscore = 1) is strongly affected by AV (OR 2.1, CI 1.6–2.9) and emergency CS (OR 1.7, CI 1.2–2.4) compared to SV delivery. The fraction of patients with a problemscore of 1 is 25% for women after elective CS, 31% after emergency CS, 35% after AV, 20% after SV, and 23% calculated for the overall patient population. Neither the presence of any non-optimal background variables nor the occurrence of clinical maternal or neonatal complications was a significant predictor for the problemscore. An analysis of the distribution of problemscores on

the individual patient level revealed that not only the fraction of responders that experienced any self reported problem but also the number of problems reported per patient differs according to the mode of delivery. Among those patients that reported any problem, 18% of women after AV reported more than 2 serious problems, while this number is 9% after SV, 2% after elective and 12% after emergency CS.

Discussion

In this study, undertaken in a setting of routine care, poor clinical results were rare in mothers and neonates and most mothers were discharged with a level of information that at least ensures a smooth transition to follow-up maternal care. However, there remain problems to be targeted. The Caesarean section rate and the frequency of interventions during delivery, in particular the episiotomy rate, are relatively high. As reported in the "*National Birth Center Study*", we also found that forceps or vacuum extraction, episiotomy and severe perineal lacerations often coincide [6]. Assisted vaginal delivery increased the risk for any postpartal complication more than twofold, and was also associated with lower 5-minute Apgar scores and umbilical cord artery pH 7.15. It should be noted though that these associations do not inform us on the causality of the observations, i.e. whether the outcomes are causally related to the instrumental delivery itself or rather to the underlying conditions (e.g. foetal distress), and we do not know whether the use of instruments may have prevented even poorer outcomes. Because instrumental use during delivery also translates into increased risk for rehospitalisation and late complications (e.g. anal incontinence and infectious morbidities) after discharge, future studies in the participating hospitals may investigate the appropriateness of instrumental delivery [7, 8]. As others, we observed an – though less strong – association of severe perineal lacerations and episiotomy [9–12]. In the current study, episiotomy was also associated with a higher risk for postpartal blood loss. Again, while the causal relationship between severe lacerations and episiotomy is unclear, the evidence suggests that the observed high episiotomy rate is unjustified and may cause more harm than good [13]. Restrictive approaches that reduce routine episiotomy remain therefore an important objective for quality improvement. Also, the fact that a considerable fraction of women did not classify themselves correctly as either having had episiotomy or not is concerning and indicates that the decision to perform episiotomy is not sufficiently communicated to these women during, or after delivery. However, at the point of answering the survey, the majority of women reported confidence in the episiotomy decision even if, from the professional perspective, the episiotomy rate seems inappropriately high. This discrepancy is not surprising because women's confidence in the episiotomy decision is rather an outcome of interpersonal quality and communication while the decision to perform episiotomy reflects technical quality and professional expertise. The divergence between both confirms the strategy to combine subjective perceptions of quality with objective clinical quality indicators. It can only be hypothesised why women after assisted vaginal delivery report considerably higher numbers of negative experiences compared to spontaneous birth, even if only questions relating to postpartum education are taken into account. One reasonable explanation is that women that had experienced instrumental delivery are less satisfied with intrapartum care and are less receptive for postpartum teaching due to this essential experience. On the other hand, hospitals may not provide postpartal care and teaching that sufficiently meet the special needs of these women. However, experiencing postpartal complications was not associated with higher problemscores, suggesting that the majority of hospitals succeed in maintaining effective communication and teaching of mothers even if complications occur. Overall, poor outcomes in terms of subjectively assessed level of information and experiences concentrate in few individuals. Quality improvement activities on the aggregate level may therefore be ineffective. Further analyses should rather aim to identify risk factors – both hospital- and patient-sided – for such clusters and develop individual strategies targeted at these patients.

This study has some limitations and conclusions have to be drawn cautiously. First, we could not link outcomes of care to individual hospitals because, based on project conventions, hospital specific data are not to be disclosed to the public. However, such linking would also allow relationships between structures and outcomes of care to be investigated. For example, Heller et al. showed that hospital caseload is an independent predictor for early neonatal mortality even in low-risk births [14]. Second, negative responses to the survey may in part be explained by the fact that for many items there is no evidence as to what exactly should be recommended (e.g. when to resume sexual activities). Unspecifity in the content of information provided, such as "as you like", may have been perceived as incomplete information, even though the issue may have been fully discussed. Third, the survey response rate of 61% is dissatisfying. Though this figure is common for surveys administered to patients during the hospital stay and a number of studies have reported comparable low rates or even lower rates, the potential source of bias is concerning [15]. The major limitation of this study,

however, is that data for only few demographic and medical background variables had been collected that serve as descriptors of the patient population. More information would be necessary for an appropriate adjustment that allows the analysis of epidemiological relationships between clinical variables. However, the aim of the "Outcomes Project" is to implement outcome measurement in routine care and to compare results among hospitals and over time. It is therefore essential to reduce the complexity of data to be collected to a dimension manageable by hospitals while ensuring comparability of patient populations across participating units. During indicator development factors usually recorded in clinical research were discussed with respect to the likelihood that the occurrence of these factors differs systematically between hospitals' patient populations and would thereby introduce bias in the comparison of hospitals' outcomes. Data of the two measurement cycles we have reported about have already lead to benchmarking of results and intensive discussions between hospitals about characteristics of obstetric patient management, appropriateness of specific interventions and organization of maternal care. Some hospitals have implemented changes in processes and started improvement activities such as the development of structured discharge appointments, preparation of educational material and interdisciplinary approaches to lower the episiotomy rate. Future measurements and analyses for trend will demonstrate whether outcomes of care respond to these efforts.

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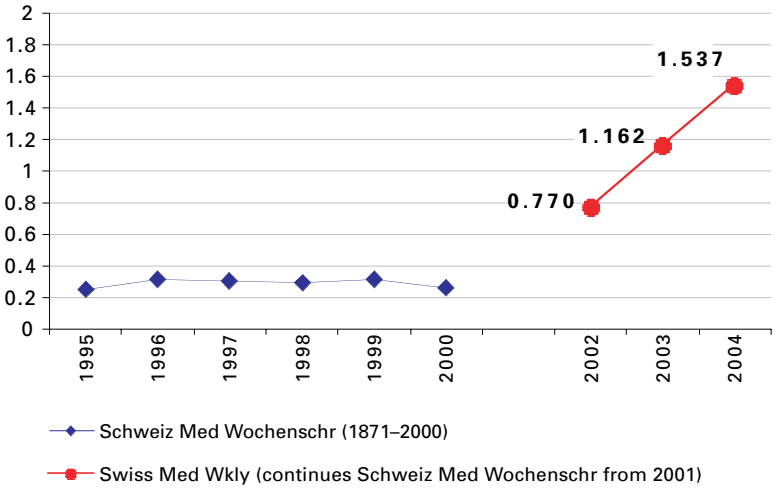

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