Indications for Cesarean Sections in Rural Nepal

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Abstract

Objective Globally, cesarean section (CS) rate is close to 26 %. Nepal has a reported CS rate of 5 %, with huge differences in rural (3.5 %) and urban (15 %) areas. The aim of the study was to determine the rate and indications for CS in a remote hospital in a rural area of Nepal.

Methods A one-year cross-sectional prospective study from August 2014 to August 2015 was performed at Okhaldhunga Community Hospital (OCH). Semi-structured interviews of all women undergoing CS (91) were done, partly with the assistance of a local translator. A maternal waiting home is connected to the hospital.

Results Out of the 864 births in the hospital, 91 CS were performed giving a CS rate of 9.5 %. The most frequent indications were: prolonged labor in 24 CS (26.4 %), abnormal fetal lie in 23 CS (25.3 %) and fetal distress in 18 CS (19.8 %). Three-quarters of CS were performed as an

emergency. Almost half of the women stayed in the maternal waiting home prior to birth.

Conclusion The CS rate at OCH was relatively low, within WHO's recommendation, with types of indication similar to other countries. There were no signs of CS overuse. Maternal request was not the sole indication in any CS.

Keywords Cesarean section · Indications · Nepal · Maternal health · Rural area · Global trends

Introduction

Globally, cesarean section (CS) rates have increased during the last decades [1] resulting in an overall CS rate close to 26 % in 2010 [2]. CS rates differ substantially in different parts of the world, ranging from approximately 1 % in some African countries (South Sudan and Niger) to 56 % in some American countries (Brazil and the Dominican Republic) [3].

There is no general agreement on the optimal CS rate [4]. The most accepted recommendation is still the one from WHO, 1985, stating that the CS rate should not exceed 15 % [5]. In 2009 WHO revised their guidelines, still recommending a CS rate between 5 and 15 % [6]. Research shows that a CS rate above 12–15 % is not associated with better outcome, neither for the mother nor the child [5].

Low CS rate might indicate poor access to CS when obstetric complications occur [4], while high rate increases the risk of maternal and neonatal morbidity [4].

One of the leading causes of death for adolescent girls is complications during pregnancy of childbirth [7]. Ninety-nine percentage of women who died of pregnancy-related complications lived in low-income countries [8]. This is the background for United Nations' (UN) millennium goals number four and five: reduce child mortality and improve maternal health [9], stating that: 'Most maternal deaths in developing countries are preventable through adequate nutrition, proper health care, including access to family planning, the presence of a skilled birth attendant during delivery and emergency obstetric care' [10]. In low-income countries, one of the biggest challenges in birth care is the low number of trained healthcare providers, particularly in rural areas. Furthermore, the transportation systems are not well developed, making emergency access to birth centers difficult [5].

It is acknowledged that when CS access improves in areas where CS access is limited, the neonatal, infant and maternal mortality rates decrease [5]. Where access is low, the health facilities may also lack the required equipment

and proper training [5]. Most maternal deaths happen in labor, delivery, or during the first 24 h postpartum [5]. Intervention in this period of time could reduce the mortality [5]. As shown in India, one of the major factors contributing to maternal deaths is the inability to get medical care in time [10].

CS is a procedure that often is lifesaving, but it is not without risk and can also become life-threatening for both mother and child [11]. Even in a low-risk population, there has been an increase in maternal morbidity when comparing elective cesarean with vaginal deliveries [12]. The incidence of immediate complications after CS is reported to be around 21 % [13]. Anesthetic complications, infections and lower breastfeeding rates are some important early complications [14]. In a long-term perspective, women with previous CS are at risk of chronic pain, infertility, bowel obstruction, uterine rupture and abnormal placentation [15].

Complications related to CS do not pose risks only to the mother. The baby is also at risk of both long- and short-term complications. Having a CS increases the risk of neonatal death [13]. Children delivered by elective CS have a higher incidence of respiratory affections and twice the risk of acute respiratory distress compared to children delivered vaginally [12, 13]. Additionally, babies delivered with CS are more likely to have allergies, obesity and other metabolic diseases [13, 16].

The Nepal National Safe Motherhood Program established in 1997 has improved maternal health services [17]. The program plays a key role in the substantial decrease in maternal mortality rate from 539 to 170 per 100,000 in last 15 years [17]. The Nepalese government made delivery in health facilities free of cost in 2009 [17]. Still only 35 % of all births in Nepal take place in a health facility. There are remarkable differences between rural and urban areas: 71 % of urban mothers deliver in a health facility, compared to 33 % in rural areas [17].

The rate of CS delivery has been relatively low in Nepal with 5 % in 2014 [18]. Despite this, in the last decade the CS rate in Nepal has quadrupled [2]. CS is more frequent among urban women (15 %) than among the rural (3.5 %) [17]. This finding reflects better access to obstetric care in urban areas. But Prakash et al. [2] raise the question whether higher CS rates in urban areas could indicate that patients in urban areas are more able and willing to pay for CS at private hospitals.

It has been requested worldwide that the indications for CS should be recognized to better understand reasons for performing CS [6, 19]. To our knowledge, this is the first study presenting CS indications at a hospital in a remote area in Nepal.

Materials and Methods

The study has a cross-sectional, prospective design. The study was performed at Okhaldhunga Community Hospital (OCH), serving approximately 250,000 people in a hilly district in the rural eastern Nepal. The area is very remote, with no paved roads and heavy rainy seasons, making access to the hospital difficult. Women in birth are often carried on a stretcher, or walk for hours or days to get to the hospital. OCH is the only hospital in this area; there are no private hospitals around. The hospital has 3–6 doctors and 16 nurses who all have been trained in birth care. E. Bøhler is the only doctor who is a permanent employee; the other 2–5 doctors are in training for their specialty in general practice or on a two-year contract. All of them are performing CS. Close to the hospital is a maternal waiting home (MWH) where women close to term can stay for free, waiting for the birth to start. They get a medical checkup daily by a nurse, with Leopold's handgrip and fetal heartbeat count.

The data were collected between August 11, 2014, and August 10, 2015. Information about all the CSs in the study period was obtained from the hospital medical record, including the birth chart and by interviewing the women, using a semi-structured questionnaire. For the five first weeks of data collecting, LJS and KRS, as part of fieldwork for their medical student thesis, filled out the questionnaire with help from a local translator and trained the doctors at OCH in how to do it. For the remaining study period, the doctor performing the CS filled out the questionnaire shortly after the operation. Questionnaires of two women were not completed, as the women had left the hospital when the doctor went to do the interview. Available data from these two CS were collected from the hospital's logbook. All the other women were interviewed. We reviewed the hospital's annual reports regarding the number of deliveries and CS for the past fourteen years made by the hospitals statistician Phanindra Dani.

At OCH 'prolonged labor' was diagnosed by using the partogram. 'Abnormal fetal lie' is suspected on clinical signs and confirmed by using ultrasound. 'Fetal distress' is diagnosed by fetal heartbeat count and sometimes together with meconium stained fluid. The hospital does not use CTG.

Ethical approval was obtained by the Internal Management Committee of OCH before the study began. A written consent was not obtained from the participants due to the high rate of illiteracy in the Okhaldhunga population. All women were thoroughly informed about the aim and aspects of this study and gave their oral consent. The survey was done to look at the trends for CS at the hospital, and all data were handled anonymously. There are no medical records at the hospital that can identify the women.

All data were analyzed using SPSS version 22 (IBM, Armonk, NY, USA).

Results

In the one-year study period, there were 864 deliveries at OCH of which 91 were performed by CS, giving a CS rate of 9.5 %.

Out of the 91 CSs, 54 women (59.3 %) were nulliparas, and 35 (38.5 %) were multiparas. The highest parity was 8, and mean parity was 1.7. The youngest mother was 17 years old, and the oldest was 41 years. The mean age was 25.4 years. Almost half of the women (48 %) stayed at the maternal waiting home (MWH). The mean duration of the stay was 5 days.

The most frequent indications were 'prolonged labor' (26.4 %), 'abnormal fetal lie' (25.3 %) and 'fetal distress' (19.8 %).

When there was more than one indication, indications were marked as 'primary indication' and 'additional indication.' More than half of the women (51.6 %) had an additional indication. 'Meconium stained fluid' ($n = 14$) and 'previous CS' ($n = 11$) were the most frequent additional indications. 'Maternal request' was the additional indication in four cases, with medical indications as primary indication (abnormal fetal lie, previous traumatic delivery and previous CS).

We found significant differences in indications among women who had stayed at the MWH and those arriving from home. More women with 'failed induction/prolonged labor' as main indication had stayed at MWH ($p = 0.007$). All women with 'previous traumatic delivery' stayed at MWH. This is given in Table 1.

In the period investigated, 91 CSs were conducted, resulting in 97 babies. Six of the deliveries were multiple pregnancies (twins). No mother died during the study period. Three babies were stillborn, all of them deceased in utero before arriving OCH. In the first case, the baby had a transverse lie. When the woman arrived at the hospital, she had a uterine rupture with vaginal prolapse of one hand and the cord. The baby was already dead. In the second case, the baby was dead as a result of a prolonged labor. The mother had been in labor for more than 72 h when arriving in hospital. In the third case, there was cephalo-pelvic disproportion: The birth weight was 5000 g and the woman had a narrow pelvis, making vaginal delivery impossible.

There has been a significant increase in total number of births at OCH in the past years. In 2001 there were 149 births at the hospital, rising to 770 in 2014. The CS rate has varied between 10 and 16 % during the 13 years as illustrated in Fig. 1.

Table 1 Primary indication for CS at OCH during the one-year study period

Main indication	Total		Nullipara		Multipara		Stayed at MWC		Came from home	
	No	%	No	%	No	%	No	%	No	%
Total	91	100	54	100	35	100	44	100	40	100
Prolonged labor/failed induction	24	26.4	18	33.3	6	17.1	17	38.6 ^a	5	12.5 ^a
Abnormal fetal lie	23	25.3	15	27.8	8	22.9	9	20.5	12	30.0
Fetal distress	18	19.8	13	24.1	4	11.4	5	11.4	11	27.5
Pelvic anatomy	12	13.2	6	11.1	5	14.3	8	18.2	3	7.5
Previous CS	7	7.7	–	–	7	20.0	2	4.5	5	12.5
Previous traumatic delivery	2	2.2	–	–	2	5.7	2	4.5	0	0
Premature rupture of membranes	1	1.1	0	0.0	1	2.9	0	0	1	2.5
Placenta abruption	1	1.1	1	1.9	0	0.0	0	0	1	2.5
Severe oligohydramnios	3	3.3	1	1.9	2	5.7	1	2.3	2	5

^a $p = 0.007$ **Fig. 1** Number of deliveries and CSs at OCH from 2000 to 2014

Discussion

We found a CS rate of 9.5 % at OCH in a remote area of Nepal. However, it is important to keep in mind the information from Nepal Demographic and Health Survey (NDHS), stating that two-thirds of births in rural Nepal are conducted at home [17]. Assuming the same situation in the Okhaldhunga district, the estimated CS rate for the area would be 3.5 % or much lower than our hospital figure. This estimate is in agreement with the 3.5 % CS rate in rural areas of Nepal reported from NDHS in 2011 [17]. Many women in OCH have to travel a long distance to get to the hospital, and transportation might be both difficult and expensive for a Nepalese farmer. This might be one of the reasons why most people still give birth at home, as their mothers and previous generations have done before them [20].

The most frequent indications for CS were ‘prolonged labor’ (26.4 %), ‘abnormal fetal lie’ (25.3 %) and ‘fetal

distress’ (19.8 %). This is as expected. A similar pattern is reported for women in different parts of the world (Cambodia, Pakistan, among others) [21, 22].

Nationally 12 % of the births delivered by CS were elective CSs, while the rest (88 %) were carried out due to complications during delivery (emergency CS) [17].

Emergency CS accounted for three-quarters of the CSs (75.8 %) in our study. The somewhat lower percentage of emergency CS in OCH could signify that more indications for CS have been identified at an earlier stage in OCH, than in the national material (88 %). Thus these CSs could be done electively since almost half (48 %) of the CS patients had been staying in the maternal waiting home before delivery and thus had close medical follow-up. More women with ‘prolonged labor/failed induction’ as main indication had stayed at MWH. The difference was significant. The reason for this could be that many of those who stayed in MWH were recommended to stay there because they had a risk factor. For some of them, that risk factor will have been prolonged labor or failed induction in previous births, or that they had very short stature. Consequently, one could act and perform a CS at the correct time with the correct diagnosis. Of the 864 vaginal births, 42 % of the mothers stayed at the free waiting home.

The ethical aspects of too high CS rate have been discussed. CSs are financially beneficial for hospitals’ income compared to normal, vaginal deliveries [6]. The CS rate is higher in private clinics than in public hospitals, even though public facilities are designed to deal with the most complicated pregnancies [23]. This is exemplified by Switzerland where private clinics had a CS rate of 41 % compared to 30.5 % in public hospitals [23]. Such differences have also been suggested in urban areas of Nepal [6]. This raises the question whether CS without medical indications are performed for economic reasons.

The healthcare financial system should be reviewed so that CS is not economically beneficial for hospitals or the private doctors compared to a vaginal delivery. We agree with Rijken et al. [11] that ‘Health workers in low-income and middle-income countries should be trained in how to avoid cesarean sections and how to perform them.’ The doctor that makes the decision of a CS is often an inexperienced, junior clinician [11]. There should be global guidelines on recommended CS rates, and the indications need to be identified so that the rate of unnecessary CS can be minimized.

We recommend further studies to look into different hospitals’ CS rates and indications.

In our material, ‘maternal request’ was the only non-medical indication. This was never a primary indication. There are no signs of an overuse of CS at OCH.

Conclusion

The CS rate at the hospital in this remote area was 9.5 %. If we assume that 65 % of births are conducted at home in Okhaldhunga, an overall estimate of the CS rate will be 3.5 %. The types of CS indication showed a normal pattern, similar to other countries. No CS was conducted for ‘maternal request’ only. All CS had a medical indication.

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Compliance with Ethical Standards

Conflict of interest The authors declare that there are no conflicts of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Animal and Human Rights This article does not contain any studies with animal subjects.

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