Audit of cesarean section by non-obstetricians in the remote part of Nepal using the Robson classification system

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ABSTRACT

Introduction: Cesarean delivery is increasing throughout the globe. It is increasing here in Nepal too. There are inequalities in cesarean deliveries in urban and rural/remote areas. Through this study, we tried to see the Cesarean delivery rate in one of the remote districts of Nepal and audited the Cesarean deliveries as per the Robson classification system.

Method: A retrospective cross-sectional study based on secondary data collection of sixteen months (Aug 2019 to Dec 2020) was designed for this purpose. We collected data from the health management and information system (HMIS) maternity registry and record files of inpatients located in District Hospital, Terhathum. We used the Robson classification system and Robson reporting table for the analysis purpose.

Result: We included 495 participants. The overall Cesarean rate was 12.9%. Robson group 1 i.e. nulliparous, single, cephalic, >37 weeks of gestation contributed most (40.63%) in cesarean delivery followed by group 5 (17.19%) i.e. multiparous, single, cephalic, >37 weeks of gestation with previous Cesarean section (CS).

Conclusion: In our study, the main contributor to CS was Robson group 1 i.e. nulliparous, single, cephalic >37 weeks of gestation followed by group 5 i.e. multiparous, single, cephalic >37 weeks of gestation with previous CS. Though the CS rate is within the WHO recommendation, we need to intervene to decrease CS in low-risk groups and strengthen hospital facilities for vaginal birth after Cesarean (VBAC).

Keywords: cesarean delivery, cs audit, robson classification

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INTRODUCTION

Various studies show that the cesarean section rate is increasing globally.[1-5] Most of the literature and authorities accept a CS rate of 10-15%. If the CS rate is <10% then there is an increased chance of more maternal and neonatal mortality and morbidity due to less access to timely cesarean section facilities. However, there is no extra benefit to maternal and neonatal mortality if the CS rate is >15%.[6]

There may be an increased risk of maternal mortality with cesarean section compared with vaginal birth.[7] The high CS rate among low-risk groups (viz. nulliparous in spontaneous labor, post-dated women) suggests that many CS might have been performed on questionable indications.[8] Ten groups classification, also known as Robson classification is a widely adopted tool to analyze the causes for cesarean section in an institute. This classification system also helps to measure the effectiveness of interventions done to decrease the CS rate in a health institute. A systemic review done to study the effectiveness of Robson Classification showed a reduction of CS rate after audit using Robson classification.[9]

In recent years, access to the emergency Cesarean section has increased throughout Nepal. In many of the district hospitals, General Practitioners and Medical Officers trained as an advanced skill birth attendant (ASBA) are providing this service where obstetricians are not available. It is better to keep track of the cesarean rate in every health facility to act timely to decrease future repeat Cesarean rate. Therefore, we designed a study to classify the Cesarean section as per the Robson classification in the District Hospital, Terhathum, Nepal. It is a rare study of its type done in the remote part of the country. We hope this study will help us to intervene timely to keep the cesarean rate at the expected level.

METHOD

We designed a retrospective cross-sectional study for this purpose. We collected secondary data from the maternity registry and inpatient record files of District Hospital, Terhathum, Province-1, Nepal. Data were collected from Bhadra 2076 to Mangsir 2077 B.S (Aug 2019 to Dec 2020).

District Hospital, Terhathum is a 15-bedded primary level hospital located in a remote hilly part of Eastern Nepal. It has a running CEONC (Comprehensive emergency obstetric and neonatal care) facility. Currently, a General Practitioner and a Medical Officer trained as an advanced skilled birth attendant are providing CEONC service.

We collected demographic data of participants and variables required for Robson classification[10] of Cesarean section. Variables used were the number of fetus, week of gestation, parity, presentation/lie, onset of labor, and previous Cesarean delivery. Patients with all the required information were included in the study. The information on the induction of labor was missing in the maternity registry (HMIS tool), therefore, we had to look into each patient's record file for this. Participants with missing information were excluded. Frequency, rate, and percentage were computed as per Robson reporting table. We analyzed the data using Microsoft Office Excel package 2016 and IBM SPSS (statistical package for the social sciences) v25.0.

We divided participants into different groups and sub-groups as per the Robson classification system (Table 1).[10]

Table 1. Robson classification

Robson's Group	Description
Group 1	Nulliparous, single cephalic ≥ 37 weeks of gestation in spontaneous labor
Group 2	Nulliparous, single cephalic, ≥37 weeks of gestation
a	Induced labor
b	CS before labor
Group 3	Multiparous, single cephalic ≥37 weeks of gestation in spontaneous labor, no previous CS
Group 4	Multiparous, single cephalic, ≥37 weeks of gestation, no previous CS
a	Induced labor
b	CS before labor
Group 5	Multiparous, single cephalic, ≥37 weeks of gestation, previous CS
Group 6	All nulliparous breeches
Group 7	All multiparous breeches (including previous CS)
Group 8	All multiple pregnancies (including previous CS)
Group 9	All abnormal lies (including previous CS)
Group 10	All single cephalic, <37 weeks of gestation (including previous CS)

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RESULT

The total number of participants was 495. The mean age of the participants was 24.09 years (SD=5.153, Skewness=0.698) and age ranged from 15 to 40 years. The mean week of gestation was 39.68 weeks (SD=2.009, Skewness= -1.776).

The total number of deliveries was 495, out of which 64 (12.9%) were Cesarean deliveries and 431 (87.1%) were vaginal deliveries. Robson Group 1 had the largest group size of 41.62% and it contributed 40.63% of total Cesarean deliveries (**Error! Reference source not found.**).

Among all the CS cases, previous CS was the major indication covering 20.31% followed by breech and non-progress of labor with each of 18.75% (Table 3.). Most of the time it was emergency LSCS except for previous CS and breech presentation where elective LSCS were also performed.

Table 2. Report table of Robson Classification

Robson Group	Number of CS in group	Number of women in group	Group size (%)	Group CS rate (%)	Absolute group contribution to overall CS rate (%)	Relative contribution of group to overall CS rate (%)
1	26	206	41.62	12.62	5.25	40.63
2a	6	52	10.51	11.54	1.21	9.38
2b	0	0	0.00	0.00	0.00	0.00
3	3	128	25.86	2.34	0.61	4.69
4a	3	48	9.70	6.25	0.61	4.69
4b	1	1	0.20	100.00	0.20	1.56
5	11	11	2.22	100.00	2.22	17.19
6	7	9	1.82	77.78	1.41	10.94
7	6	8	1.62	75.00	1.21	9.38
8	0	2	0.40	0.00	0.00	0.00
9	0	0	0.00	0.00	0.00	0.00
10	1	20	4.04	5.00	0.20	1.56

Table 3. Indications for CS

Indication for CS	Frequency (%)	Number of Elective LSCS	Number of Emergency LSCS
Previous CS	13 (20.31)	8	5
Breech	12 (18.75)	6	6
Non-progress of labor	12 (18.75)	0	12
Cephalopelvic disproportion	7 (10.94)	0	7
Prolonged 2nd stage of labor	9 (14.06)	0	9
Thick meconium stained liquor	6 (9.38)	0	6
Pregnancy induced hypertension	2 (3.13)	0	2
Failed Induction of labor	1 (1.56)	0	1
Mentoposterior presentation	1 (1.56)	0	1
Compound presentation	1 (1.56)	0	1
Total	64 (100)	16	48

DISCUSSION

We conducted a retrospective study among 495 deliveries in District Hospital, Terhathum over 16 months. Overall CS rate was 12.9%, which is within the recommended CS rate as per WHO.[11] According to the latest data from 150 countries, 18.6% of all births occur by CS, ranging from 6% to 27.2% in the least and most developed regions, respectively. Based on the data from 121 countries, the trend analysis showed that between 1990 and 2014, the global average CS rate increased to 12.4% (from 6.7% to 19.1%) with an average annual rate of increase of 4.4%.[2] There was an overall increase in CS rate across the globe between the WHO Global Survey of Maternal and Perinatal Health (WHOGS; 2004–08) and the WHO Multi-Country Survey of Maternal and Newborn Health (WHOMCS; 2010–11).[12] Similarly, another observational study done from 2000-2008 showed an increase in CS rate among the previous CS group, nulliparous term cephalic in spontaneous labor. Further, the proportion of induction of labor decreased in favor of elective CS.[1] A study done in Israel showed an increase in cesarean delivery of twins between January 1995 and December 2015 without any significant benefit in maternal and neonatal morbidities.[4] According to the Nepal Demographic and Health Survey 2016, 44.2% of

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the deliveries in rural Nepal occur in health institutions with a CS rate of 5.72%.[13] A study done in Tribhuvan University Teaching hospital (TUTH) Kathmandu showed an increase of CS rate from 16.6% to 25.4% over 5 years (from 2005 to 2010).[14] Another study done by Poudel R, et al in Kathmandu Model Hospital showed a CS rate of 66.1% in 2018.[15] According to the National Demographic Health Survey, Nepal (1996 to 2016), the institutional-based CS rate increased from 10.4% in 1996 to 16.4% in 2016.[16] CS rate between 9-16% decreases maternal and neonatal mortality and CS rate higher than this threshold had no association with mortality outcomes regardless of adjustment.[17]

Maximum number of CS was done in group 1 (40.63%) i.e. nulliparous, single, term, cephalic with spontaneous onset of labor. A similar pattern of CS distribution was seen in a study done by Amatya A, et al,[14] Malla RV, et al,[18] and Poudel R, et al[15] in Tribhuvan University Teaching Hospital; Nepalese Army Institute of Health Sciences, Shree Birendra Hospital; and Kathmandu Model Hospital respectively. However, a study done in Canada showed group 5 (multipara, cephalic >37 weeks with previous CS) as the greatest contributor to CS.[19] Lithuania's experience also showed groups 1, 2, and 5 as main contributors of CS.[20] In the subgroup of the seven clinics where the collective CS rate had decreased from 23.2% in 2008 to 19.3% in 2016, the main contributors to this decrease were Robson groups 1 and 2.[5]

Low-risk groups (group 1, 2, 3, and 4) were a major contributor (59.38%) of Cesarean section rate (CSR) in our study. These groups can be the target groups to achieve an overall reduction in CSR. The cesarean section in these groups for non-absolute medical indications (failure to progress, fetal compromise) can be minimized by close monitoring of labor and optimal use of instrumental deliveries.[21] Group 5 women were the second major contributors (17.19%) for CSR in our study. The way to reduce CS in this group is to prevent CS in the first place or promote VBAC in women with non-recurrent indications in the previous CS. We should judiciously make use of VBAC but not at the cost of maternal or fetal health.[22] A trial of vaginal birth after Cesarean section (VBAC) can be offered to pregnant women without contraindications with high success rates (84.93%).[23] Setting up a dedicated VBAC clinic for a pregnant lady with at least one previous CS and re-defining the failure of induction of labor may decrease CS rate.[24] Audit and feedback, quality improvement, and multifaceted strategies like involving the health workers in analyzing and modifying the clinical practice were effective for reducing the cesarean section rate.[25]

The cause for an increase in non-medically indicated Cesarean can be many. The economic incentive is counted among the many reasons for this increase. The decreased trend of vaginal birth after Cesarean (VBAC) is another cause.[26] A study showed that women's preference for Cesarean section varied from 0.3 to 14 percent. Women's preference for a cesarean section related to psychological factors, perceptions of safety, or in some countries, was influenced by cultural or social factors.[27]

This study was conducted in a small setting with few numbers of participants. Interventional studies with a larger sample size will help to generalize the finding to the general population and to generate ways to reduce the Cesarean section rate.

CONCLUSION

In this retrospective cross-sectional study, the main contributor to CS was Robson group 1 i.e. nulliparous, single, cephalic >37 weeks of gestation followed by group 5 i.e. multiparous, single, cephalic >37 weeks of gestation with previous CS. Though the CS rate is within the WHO recommendation, we need to decrease CS in low-risk groups and strengthen hospital facilities for VBAC.

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