Original Article

Indications for Caesarean Section and its Fetal and Maternal Outcome in a Teaching Hospital, Province Five, Nepal

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ABSTRACT

Introduction: Cesarean section (CS) is an operative technique by which a fetus is delivered through an abdominal and uterine incision and is effective in saving maternal and infant lives but caesarean section rates higher than 10% are not associated with reductions in maternal and newborn mortality rates. The objective of the study was to find out the indications for caesarean section and its fetal and maternal outcomes in a Teaching Hospital, Province Five, Nepal.

Methods: A descriptive, cross-sectional study was conducted in a teaching hospital, Nepal. A total of 150 purposively selected postnatal mothers after caesarean section were interviewed by face to face technique using a structured interview schedule. Analysis and interpretation of the findings were done with the help of descriptive and inferential statistics.

Results: The study showed that the majority (93.3%) of mothers had undergone an emergency caesarean section and the majority (92%) had maternal indications for caesarean section. Among them, one third had previous caesarean section followed by 14.5% obstructed labour. Fetal indications include breach (44.4%), fetal distress (29.6%), big baby (11.1) and twins and triplets (3.7%). Only (10.7%) had an unfavorable fetal outcome which includes the need for Neonatal Intensive Care Unit (NICU) (31.2%) followed by neonatal death (25%). Only three mothers (2%) had unfavorable maternal outcome which includes Post-Partum Hemorrhage (PPH); need for blood transfusion and fever respectively. There was no statistically significant association between socio demographic characteristics and type of caesarean section. There was statistically significant association between the previous history of caesarean section and type of caesarean section (P= .005).

Conclusions: Previous caesarean section was the most common indication for caesarean section. Unfavorable outcome after caesarean section was considerably present which need to be addressed.

Keywords: Caesarean Section, Indications, Maternal Outcome, Fetal Outcome

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INTRODUCTION

Caesarean section (CS) is an operative technique by which a fetus is delivered through an abdominal and uterine incision. When medically indicated, it is a life-saving procedure for both the mother and the fetus. The rate of caesarean section is increasing in developing countries despite the World Health Organization (WHO) recommendations of 5% to 15%[1]. The effects of caesarean section on maternal and perinatal morbidity are still unclear. More research is needed to understand the health effects of caesarean section[2].

The trends from 150 countries shows that between1990 to 2014, 18.6% of births occur by caesarean section, ranging from 6% to 27.2% in the least and most developed regions respectively. The global average caesarean section rate increased by 12.4% and in Asia (15.1%)[3]. High caesarean section rate does not improve perinatal outcomes in babies[4] .Caesarean section rates higher than 10% at the population level are not associated with decrease in maternal and neonatal mortality rates[2,5].The expansion of the private health sector may be playing a significant role in expansion of caesarean section[6,7].

Morbidity and mortality from caesarean section is more than in vaginal delivery for both the mother and fetus [8-10]. Routine monitoring of clinical indication of caesarean section in public and private facilities is needed for rational use of the procedure[11].The unfavorable outcomes of caesarean section are adhesion, excessive blood loss, caesarean hysterectomy, wound infection, dehiscence, still birth, early neonatal death and low birth weight[12].

There is increasing trend of caesarean section in Nepal[13, 14]. According to Department of Health Services (DOHS) in Nepal, in fiscal year2074/75 deliveries by caesarean section were 17 percent of total institutional deliveries which was above WHO recommendations[15]. The rise in caesarean section rate has been a cause of alarm and needs an in-depth study in Nepal[16]. Thus, the study was done to find out indications of caesarean section and its fetal and maternal outcome.

MATERIALS AND METHODS

Descriptive Cross-Sectional study design based on quantitative approach was used in the study. The study was conducted at Nepalgunj Medical College, Teaching

Hospital, Province Five, Nepal which is the referral level hospital with high patient flow and safe motherhood programme has been launched. The study populations were postnatal mothers after caesarean section and about to discharge from the hospital. Mothers after having vaginal delivery and not willing to participate in the study were excluded in the study**.** Non probability purposive sampling technique was used.

Prevalence of caesarean section at Nepalgunj Medical College (record of hospital) shows percentage of caesarean section was 24% of total delivery. Therefore, p = 0.24, q=0.76

The sample size was calculated by using Cochran's formula[19]

$N = Z^2pq/l^2$ with the desired precision of 7%

Standard normal deviate (z) =1.96

Absolute allowable error (l) = 0.07

$N= (1.96)^2*0.24*0.76/ (0.07)^2=143$

To reduce non response rate, additional 5% was taken so, 5% of 143= 7.15

Final sample size was 150

Structured interview based questionnaire was used to collect the data which was developed by the researchers themselves based on literature and consultation with expertise.

The content validity of the test instrument was established by consulting with advisors, subject matter experts, and literature review.

Pretesting of the instrument was done among 10% mothers admitted in maternity unit of Nepalgunj Medical College and those pretested respondents were excluded from the study. The instrument was translated in Nepali language and then retranslated back to English to retain the same meaning. Data was collected through face to face interview technique and the record review from the mother's file by the researchers from January 9 2020 to First March 2020.

Ethical approval was taken from Institutional Review Committee (IRC) of Nepalgunj Medical College, Teaching Hospital (Ref no. 451/076/077). Informed consent was obtained from the participants and they were given liberty to discontinue participating in the study if they wish. Precaution was taken throughout the study in every step to safeguard the right and welfare of all respondents in the study and confidentiality was maintained. The collected data were checked for completeness, edited, coded and entered in SPSS version 20 for analysis. Descriptive statistics (frequency, percentage, mean, range and standard deviation) and inferential statistics (Chie square test, Odd ratio) were done and interpreted as per findings.

RESULTS

Results were obtained from total of 150 postnatal mothers after caesarean section. As shown in Table1a, one third (33.3%) of the mothers were between 20-24 years of age, 8.7 % were below 20 and only (6.0%) were 35 years and above. Regarding ethnicity, more than half (54%) of the mothers belong to Brahmin/ Chhetri followed by 30% Janjati. In regards to type of family, half of the mothers (50.7%) were living in nuclear family and other half in joint family. Likewise, all the mothers were married.

Table 1a: Socio demographic Characteristics of Mothers: Age, Ethnicity, Type of Family, Marital status

Socio demographic Characteristics	Number	Percentage
Age(in years)		
< 20	13	8.7
20-24	50	33.3
25-29	44	29.3
30-34	34	22.7
35 and above 35	9	6.0
Mean age= 26 years **S.D. = ± 4.995 Years** **Range=17-38 years**		
Ethnicity		
Brahmin/Chhetri	81	54.0
Janajati	45	30.0
Dalit	20	13.3
Madhesi	4	2.7
Type of family		
Nuclear	76	50.7
Joint	74	49.3
Marital Status		
Married	150	100.0

Table 1 b: Socioeconomic Characteristics of Mothers: Educational status, Occupation, Religion, Family Income Status

Socio Economic Characteristics	Number	Percentage
Educational Status(n=150)		
Illiterate	1	0.7
Literate	149	99.3
Educational level(n=149)		
Primary level	16	10.7
Secondary level	86	57.7
Higher secondary level	38	25.5
Higher education	9	6.0
Occupation (n=150)		
Agriculture	11	6.2
Homemaker	113	63.8
Business	9	5.1
Service	14	7.9
Student	3	1.7
Religion (n=150)		
Hinduism	145	96.7
Christianity	5	3.3
Family Income Status (n=150)		
Enough for less than six months	1	0.7
Enough for less than one year	73	48.7
Enough for one year and surplus	76	50.7

As shown in Table 1b, almost all (99.3%) of mothers were literate. Among literate, 57.7% were secondary level and only (6.0%) were higher education. Likewise, most (63.8%) of the mothers were homemaker. Similarly, majority of the mothers (96.7%) were Hindu and only 3.3% were Christian. Half of the mothers (50.7%) had household income enough for one year and surplus.

Table 2a: Obstetric Characteristics of Mothers: Parity, Planned Pregnancy, ANC visits, Weeks of gestation

Obstetric Characteristics	Number	Percentage
Parity		
Primiparous	70	46.7
Second para	56	37.3
Third para	19	12.7
Fourth para	4	2.7
More than fourth para	1	0.7
Planned Pregnancy		
Yes	145	96.7
No	5	3.3
ANC visits		
Yes	149	99.3
No	1	0.7
No. of ANC Visits (n=149)		
Less than 4 times	15	10.1
Four times	128	85.9
More than 4 times	6	4.0
Weeks of gestation		
Below 37	17	11.3
37-42	128	85.3
Above 42	5	3.3

As shown in Table 2a, less than half (46.7%) of the mothers were primiparous. Likewise, majority (96.7%) of the mothers reported that their pregnancy was planned. Regarding Antenatal visits, almost all (99.3%) of the mothers had visited ANC and majority (85.9%) of mothers had visited ANC for four times. Likewise, majority (85.3%) were at 37-42 weeks of gestation.

Table 2b: Obstetric Characteristics of Mothers: History of abortion, still birth, previous history, type of caesarean section, Pregnancy Complication, weight, sex of baby

Obstetric Characteristics	Number	Percentage
History of abortion		
Yes	27	18.0
No	123	82.0
No. of Abortion (n=27)		
One	21	77.8
Two	4	14.8
Three or more	2	7.4
History of still birth		
Yes	2	1.3
No	148	98.7
Previous history of caesarean		
Yes	42	23.7
No	108	61.0
Complications during pregnancy		
Yes	16	10.7
No	134	89.3
Type of complication (n=16)		
Ante partum Hemorrhage (APH)	4	25.0
Pregnancy Induced Hypertension (PIH)	11	68.8
Severe vomiting	1	6.2
Type of caesarean section		
Elective	10	6.7
Emergency	140	93.3
Sex of Recent Baby (n=153)		
Male	93	60.78
Female	60	39.21
Birth weight of baby in Kg (n=153)		
Below 2.5	28	18.3
2.5-3.5	109	71.24
Above 3.5	16	10.46

Table 2b revealed that only 18% of mothers had history of abortion. Among them, most (77.8%) of the mothers had single history of abortion and only 1.3% had history of still birth. Only 23.7% of mothers had previous history of caesarean section. Only 10.7% of the mothers had complication during pregnancy. Majority (93.3%) of mothers had undergone emergency caesarean section and only (6.7%) had elective caesarean section. Regarding sex of the recent baby, most (60.78%) were male and 39.21% were female. Most (71.24%) of the babies weight was within normal range i.e. 2.5 to 3.5 kg.

Table 3: Indications for Caesarean Section

Indications*	Number	Percentage
Fetal Indications(n=27)		
Fetal Distress	8	29.6
Intra Uterine Growth Retardation (IUGR)	2	7.4
Big Baby	3	11.1
Twins	1	3.7
Breech	12	44.4
Triplet	1	3.7
Maternal Indications(n=138)		
Contracted Pelvis	8	5.8
Placenta Praevia	4	2.9
Pregnancy Induced Hypertension	6	4.3
Previous Caesarean section	43	31.2
Poly/Oligohydraminous	15	10.9
Early Membrane Rupture	3	2.2
Prolonged Labour	11	8.0
Meconium Stained liquor	13	9.4
Preeclampsia/ Eclampsia	9	6.5
Obstructed Labour	20	14.5
Gestational Diabetes Mellitus (GDM)	1	0.7
Non Progress Of Labour (NPOL)	2	1.4
Failed Induction	3	2.2

*Multiple Responses

Regarding indications, majority (92%) of mothers had maternal indications for caesarean section and only 18% had fetal indications. One third (31.2%) was previous caesarean section as maternal indications for caesarean section followed by 14.5% obstructed labour. Fetal indications for caesarean section were 44.4% breech followed by fetal distress 29.6% (Table 3).

Table 4: Fetal and Maternal Outcome after Caesarean Section

Outcome	Number	Percentage
Fetal Outcome		
Unfavorable	16	10.7
Favorable	134	89.3
Unfavorable Fetal Outcome (n=16)		
Birth asphyxia	1	6.2
Neonatal death	4	25.0
Low APGAR	3	18.8
Need for NICU	5	31.2
Difficulty feeding	2	12.5
Eye infection	1	6.2
Maternal Outcome		
Unfavorable	3	2.0
Favorable	147	98.0
Unfavorable Maternal outcome (n=3)		
Postpartum hemorrhage (PPH)	1	33.3
Need for blood transfusion	1	33.3
Fever	1	33.3

As shown in table 4, only (10.7%) of mothers had unfavorable fetal outcome, which included 31.2% need for NICU followed by 25% neonatal deaths. Only three mothers (2%) had unfavorable maternal outcome including PPH, need for blood transfusion and fever respectively.

Table 5: Association between Socio demographic Characteristics of Mothers and Caesarean Section

Type of caesarean section				
Variables	**Elective N (%)**	**Emergency N (%)**	**P value**	**Unadjusted OR 95% CI**
Age				
Below 25	2(3.2%)	61(96.8%)	.193 ª	.324(.066-1.580)
25 and above	8(9.2%)	79(90.8%)		1
Ethnicity				
Brahmin/Chhetri	6(7.4%)	75(92.6%)	1.000 ª	1.220(.329-4.519)
Others	4(6.2%)	75(92.6%)		1
Type of family				
Nuclear	7(9.2%)	69(90.8%)	.327 ª	2..401(.597-9.664)
Joint	3(4.1%)	71(95.9%)		1
Educational level				
Up to secondary	8(7.8%)	94(92.2%)	.506 ª	1.915(.391-9.387)
Higher secondary and above	2(4.3%)	45(95.7%)		1
Occupation				
Homemaker	8(7.1%)	105 (92.9%)	1.000 ª	1.219(.246-6.033)
Others	2(5.9%)	32(94.1%)		1
Family Income Status				
One year and Surplus	6(7.9%)	70(92.1%)	.746 ª	1.500(.406-5.547)
Less than One year	4(5.4%)	70(94.6%)		1

*Pearson's Chi-Square test, ªFisher Exact Test, *P value significant at <0.05 level, 1 Reference*

In this study, there was no statistically significant association between socio demographic characteristics and type of caesarean section (Table 5).

Table 6: Association between Obstetric Characteristics of Mothers and Caesarean Section

Type of Caesarean Section				
Variables	**Elective**	**Emergency**	**P value**	**Unadjusted OR 95% Confidence Interval**
Parity				
≤ Second para	8 (6.3%)	118 (93.7%)	.662[a]	.746(.148-3.749)
> Second para	2 (8.3%)	22 (91.7%)		1
No. of ANC				
≤4 times	9(6.3%)	134(93.7%)	.346 [a]	.336(.035-3.188)
>4 times	1(16.7%)	5(83.3%)		1
Weeks of gestation				
Below 37	2(11.8%)	15(88.2%)	.316[a]	2.083(.404-10.734)
37 and above	8(6.0%)	125(94.0%)		1
History of caesarean section				
Yes	7(16.7%)	35(83.3%)	.005[a]*	7.000(1.717-28.545)
No	3(2.8%)	105(97.2%)		1
History of abortion				
Yes	2(7.4%)	25(92.6%)	1.000[a]	1.150(.230-5.746)
No	8(6.5%)	115(93.5%)		1
Complications during pregnancy				
No	9(6.7%)	125(93.3%)	1.000[a]	1.080(.128-9.127)
Yes	1(6.2%)	15(93.8%)		1
Weight of baby				
Above 3.5	3(18.8%)	13(81.2%)	.075[a]	4.187(.965-18.173)
Below 3.5	7(5.2%)	127(94.8%)		1

*Pearson's Chi- Square test, *P value significant at <0.05 level, [a]Fisher Exact test, 1Reference*

In this study, there was statistically significant association between the previous history of caesarean section and type of caesarean section (*P*= .005) (Table 6). Although insignificant in other variables, those mothers who were below 37 weeks of gestation were 2.083 times more likely to have elective caesarean section than above 37 weeks (*P*=.316; OR=2.083; CI=.404-10.734). Likewise, baby with birth weight above 3.5 kg were 4.187 times more likely to have elective caesarean section than those with birth weight below 3.5 kg(*P*=.075;OR=4.187;CI=.965-18.173).

DISCUSSION

In this study, majority (93.3%) of mothers had undergone emergency caesarean section and only (6.7%) had elective caesarean section. Similarly, the study conducted in Nigeria showed that emergency caesarean section was 74.6%, while elective caesarean section was 25.6%[7]. Likewise, nearly one third (31.2%) had previous caesarean section as maternal indications for caesarean section followed by 14.5% obstructed labour,10.9% as poly/oligohydraminous, 9.4% as meconium stained liquor and only (1.4%) as non progress of labour. The study shows that 44.4% was breech as fetal indications for caesarean section followed by 29.6% fetal distress. In consistent with the study, the study conducted in Nepal Medical College Teaching Hospital showed that slow progression of labour, previous caesarean section, fetal distress and breech presentation were the first four common indications of caesarean delivery[14.]

Another study done in England showed that breech presentation and previous caesarean section were associated with an increased risk of caesarean section[17]. Also, the study conducted in Nigeria showed obstructed labour, fetal distress were the causes for caesarean section4. In contrast to the study, the study conducted in B.P. Koirala Institute of Health Sciences showed that the most common indication for caesarean section was 23.4% meconium- stained liquor, 17.2% previous caesarean section followed by 11.1% breech, 9.6% fetal distress and 7.2% non-progress of labor[13].

Regarding outcome after caesarean section, only (10.7%) of mothers had unfavorable fetal outcome. Among them, 31.2% of babies need NICU followed by 4(25%) neonatal death, 18.8% low APGAR and only 6.2% have birth asphyxia and eye infection. Also the study shows that only 3 (2%) mothers have unfavorable maternal outcome which include PPH, need for blood transfusion and fever respectively. This finding is in consistent with the study conducted in Ethiopia showed that the maternal complications was excessive blood loss (5.6%),fetal complication after caesarean section was early neonatal death (2.4%), low birth weight (17.2%), and low APGAR score (20.4%)[12]. In contrast to the study, the study conducted in Nepal Medical College Teaching Hospital showed that the incidence of complication was 23.9% of all deliveries and postpartum hemorrhage was (69.2%). Three babies had APGAR score less than 3 and there were 2 neonatal deaths after caesarean delivery[14].

In this study, there was no statistically significant association between socio demographic characteristics and type of caesarean section. In contrast to the study, the study done in Oman showed that increased

age (above 25 years) was significantly associated with increased risk of cesarean section[18]. Another study conducted in England showed that increasing maternal age was independently associated with CS[17].

In this study, there was statistically significant association between the previous history of caesarean section and type of caesarean section (*P*= .005). Although insignificant in other variables, those mothers who were below 37 weeks of gestation were 2.083 times more likely to have elective caesarean section than above 37 weeks (*P*=.316; OR=2.083; CI=.404-10.734). Likewise, baby with birth weight above 3.5 kg were 4.187 times more likely to have elective caesarean section than those with birth weight below 3.5 kg (*P*=.075; OR=4.187;CI=.965-18.173). In consistent with the study, the study conducted in England showed that previous caesarean section, extremes of neonatal birth weight was associated with caesarean section. But in contrast to the study, increasing parity was associated with decrease of elective caesarean section[14].

CONCLUSION

Majority of mothers had emergency caesarean section with previous caesarean section being the main indication. Unfavorable outcome after caesarean section included need for NICU, neonatal death, low APGAR, difficulty feeding, birth asphyxia, eye infection, PPH, need for blood transfusion and fever which need to be decreased by increasing quality of service.

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