

# Maternal and Fetal Outcomes Following Caesarean Section in Comprehensive Emergency Obstetric Care Program at Nuwakot District Hospital

**Bhandari BR**

Department of Obstetrics and Gynaecology, MIDAT Hospital, Lalitpur, Nepal

**Received:** June 12, 2015 ; **Accepted:** December 5, 2015

**Aims:** This study was conducted to assess the fetal and maternal outcomes following cesarean section in Trishuli District Hospital at Nuwakot, Nepal.

**Methods:** A hospital based study was conducted in Trishuli District Hospital Nuwakot from 14<sup>th</sup> March 2012 to 13<sup>th</sup> March 2013 among 327 pregnant women who underwent cesarean section in Trishuli District Hospital Nuwakot and met the inclusion criteria of this study.

**Results:** The most common indication of caesarean section was (n=139, 42.6%) foetal distress (n=98, 30% moderate to thick meconium stained liquor; n=41, 12.6% foetal tachybradycardia). Among maternal complications, wound infections was seen in seven (2.1%) pregnant women, uterine rupture in two (0.6%), post partum haemorrhage in one (0.3%), post partum eclampsia in one (0.3%) and puerperial pyrexia in one (0.3%). Among perinatal complications, birth asphyxia was present in 10 (3%) neonates, neonatal sepsis in seven (2%) and perinatal death in 12 (3.5%) neonates.

**Conclusions:** Better BEmOC reduced the number of CEmOC requirement. Providing CEmOC in district level is the vital measure in safe motherhood for reducing maternal and perinatal morbidities and mortalities. But for improving maternal and perinatal outcomes in district level, there should be adequate skilled manpower in maternity ward and operation theatre, adequate infrastructures in preoperative, operative and postoperative wards, blood bank and neonatal high dependency unit in CEmOC.

**Keywords:** comprehensive emergency obstetric care; maternal outcome; perinatal outcome.

## INTRODUCTION

Nepal has made satisfactory progress in many areas of health and social development. In 1996, high maternal mortality of 539 per 100,000 live births remains a major challenge for the country. Government of Nepal, having had endorsed the Millennium Declaration (2001) remains committed to the achievement of Millennium Development Goals (MDG), which requires reduction of maternal mortality ratio (MMR) by two thirds (129-213/100,000 live births), by 2015.<sup>1</sup> Although Nepal's health system has experienced nearly 10 years of severe disruption caused by armed conflict, the country managed to almost halve its MMR from 539 deaths per 100,000 live births for 1989–1995 to 281 deaths per 100,000 live births for 1999–2005. Even with this progress, one woman was dying every four hours as a result of pregnancy

and childbirth. Most maternal deaths were a direct consequence of under-utilization of appropriate health services and low quality of care, especially in rural areas. Other factors included traditional beliefs held by women, their families and communities and the lack of awareness of services and their utilization.<sup>2</sup>

Comprehensive Emergency Obstetric Care (CEmOC) comprises all component of basic emergency obstetric care (BEmOC) along with surgery (cesarean section and laparotomy) and blood transfusion. It is recognized that only access to EmOC can substantially reduce maternal mortality rate.<sup>3</sup>

Caesarean section is defined as delivery of the fetus, alive or dead, through incision in the abdominal wall and the uterine wall. Improved anaesthetic techniques and antiseptic procedures have revolutionized modern obstetrics practice.<sup>4</sup>

The World Health Organization (WHO) estimates that globally, between four and nine million newborns suffer birth asphyxia each year. Birth asphyxia leads to an estimated 1.2 million deaths and about the same number of infants who develop severe consequences, such as epilepsy, cerebral palsy, and developmental delay. WHO estimates for global neonatal deaths

## CORRESPONDENCE

Dr Binaya Raj Bhandari  
Department of Obstetrics and Gynaecology  
MIDAT Hospital Lalitpur, Nepal.  
Email: bhandaribinaya9@gmail.com  
Phone: +977-9841759010

caused by birth asphyxia are 29%.<sup>5</sup>

CEmOC is very much important component of health system for reducing maternal and neonatal morbidity as well as mortality in district level of Nepal. This study aimed to assess the maternal and neonatal outcomes in pregnant women who had come for CEmOC service in Nuwakot.

## METHODS

A hospital based study was carried out in Trishuli District Hospital Nuwakot from 14<sup>th</sup> March 2012 to 13<sup>th</sup> March 2013. Three hundred and twenty seven pregnant women who presented to labour room for management of late pregnancy and different stages of labour were included for the study. Women with complicated pregnancy need referral to higher center for further management and women who did not give informed consent were excluded from the study.

Ethical clearance for the study was taken from administration of Nuwakot district hospital. Informed consents were taken from the participants.

All women who had undergone caesarean section and fulfilling the inclusion criteria were enrolled for the study. Age, address, ethnicity, caste, parity, period of gestation, obstetric history, labour events, indications for caesarean section, operative complications, post-operative complications and duration of hospitalization were recorded in maternal data. Number of baby, sex of baby, birth weight, colour of liquor, one and five minute APGAR scores, need for resuscitation, referral to neonatal intensive care unit, neonatal complications and duration of hospitalization were documented in neonatal data. Questionnaire was reviewed thoroughly for accuracy, completeness and consistency. A master table and quantitative data were entered and analysed using Statistical Package for Social Studies (SPSS) version 15.

## RESULTS

During the study period of 12 months, 327 women who had undergone caesarean section were included in the study. Almost 90.2% pregnant women were from Nuwakot, 4.9% from Rasuwa, 1.8% from Dhading and 3% from other district of Nepal. The mean age of pregnant women was 23±4.29 years with minimum age of 16 years and maximum age of 40 years. Approximately 42.5% were disadvantaged janajatis, 36.5% upper caste group, 14.5% relatively

advantaged janajatis and 6.5% were dalit by ethnicity. About 63.6% pregnant women were primigravida and 21.1% were second gravida. Seventy seven percent women presented to labour room between 37 to 41 weeks, 17.7% at > 41 weeks and 5.3% at < 37 weeks of period of gestation. Around 84% pregnant women had cephalic presentation, 10.4% breech presentation, 2% twin pregnancy, 2.5% shoulder presentation and 1% face presentation (Table 1).

**Table 1. Characteristics of pregnant women based on address, age, ethnicity, parity, period of gestation and presentation.**

Characteristics	Number	%
<b>Address</b>		
Nuwakot	295	90.2
Rasuwa	16	4.9
Dhading	6	1.8
Others	10	3
<b>Age in years</b>		
15-19 years	55	16.8
20-24 years	157	48
25-29 years	86	26.3
30-34 years	21	6.4
35-39 years	6	1.8
≥ 40 years	2	0.6
<b>Ethnicity</b>		
Dalit	19	5.8
Disadvantaged Janajatis	139	42.5
Religious minorities	2	0.6
Relatively advantaged Janajatis	47	14.4
Upper caste	120	36.7
<b>Parity</b>		
Primigravida	208	63.6
Multigravida	119	36.4
<b>Period of Gestation</b>		
< 37 weeks	17	5.3
37-41 weeks	252	77
> 41 weeks	58	17.7
<b>Presentation</b>		
Cephalic	275	84.1
Breech	34	10.4
Twin	7	2.1
Transverse lie with Shoulder presentation	8	2.4
Face	3	1

The indications of caesarean section were foetal distress in 139 (42.6%) {98 (30%) moderate to thick meconium stained liquor, 41 (12.6%) foetal tachybradycardia}, failed induction in 49 (15%), abnormal presentation in 48 (14.6%), severe oligohydramnion in 26 (8%), bad obstetrics history in 16 (5%), non-progress of labour in 16 (5%), cephalopelvic disproportion in 12 (3.6%), prolonged second stage of labour in 10 (3%), antepartum haemorrhage in 7 (2%) and intrauterine growth retardation in 4 (1.2%) {Table 2}.

**Table 2. Indications of Caesarean section.**

Indications	Number	Frequency
Foetal distress	139	42.6
Failed induction	49	15
Abnormal presentation	48	14.6
Severe oligohydramnion	26	8
Bad obstetrics history	16	5
Non progress of labour	16	5
Cephalopelvic disproportion	12	3.6
Prolonged second stage of labour	10	3
Antepartum haemorrhage	7	2
Intrauterine growth retardation	4	1.2

Among caesarean section, emergency caesarean section was in 292 (89.2%) pregnant women, elective caesarean section in 34 (10.5%), classical caesarean section in two (0.61%) and emergency laparotomy with subtotal hysterectomy was done in one (0.3%) pregnant women. There were 16 (5%) pregnant women who had previous caesarean section done in the past. Bilateral tubal ligation was done in 50 (15.3%) pregnant women who had received CEmOC service. There were two cases of uterine rupture, emergency laparotomy with repair of uterine rupture and bilateral tubal ligation done in one patient and emergency laparotomy with subtotal hysterectomy done in one patient. Along with CS, enucleation of dermoid cyst was performed in 3 (1%) pregnant women.

The mean days of hospital stay was 4±2.2 days with ranges from 2-10 days. There was one patient

referred to tertiary center for better management after emergency laparotomy with subtotal hysterectomy for obstructed labour with uterine rupture.

There were no maternal complications in 315 (96.43%) women, seven women (2.1%) developed wound infections, two women (0.61%) uterine rupture, one woman (0.3%) post-partum haemorrhage, one woman (0.3%) post partum eclampsia and one woman (0.3%) developed puerperal pyrexia. Blood transfusion was required in two (0.6%) women for severe blood loss. There was no maternal mortality among CEmOC clients during study period (Table 3).

**Table 3. Maternal complications.**

Maternal complications	Number	Frequency
None	315	96.43
Wound infections	7	2.1
Uterine rupture	2	0.61
Post partum haemorrhage	1	0.3
Post partum eclampsia	1	0.3
Post partum puerperal pyrexia	1	0.3

Seven women developed wound infection following caesarean section and only two women had undergone secondary suturing along with hospital readmission and intravenous antibiotics. 327 (98%) babies were alive at birth. 170 (51%) babies were male and 164 (49%) were female. The mean birth weight of babies was 3160±455 grams with minimum weight of 1400 grams and maximum weight of 4800 grams. There were 64 (19.1%) babies who had low birth weight and five (1.5%) babies had weight ≥ 4000 grams. APGAR scores > 5/10 was seen in 298 (89.2%) babies, >3 to ≤5/10 in 21 (6.3%) babies, ≤3/10 in eight (2.5%) babies and 0/10 APGAR scores as seen in seven (2%) babies (Table 4).

**Table 4. Characteristics of babies at birth.**

Characteristics	Number	%
Alive	327	98
Dead	7	2
Male	170	50.9
Female	164	49.1
<b>Birth weight of baby</b>		
≤1500 grams	3	0.9
> 1500 < 2500 grams	61	18.2
2500- 3500 grams	250	74.9
> 3500 < 4000 grams	15	4.5
≥ 4000grams	5	1.5
<b>APGAR Scores at 1 min</b>		
> 5/10	298	89.2
> 3/10 to ≤ 5/10	21	6.3
≤ 3/10	8	2.5
0/10	7	2

There were no neonatal complications in 299 (89.5%) babies, 10 (3%) developed birth asphyxia, seven (2%) neonatal sepsis, seven (2%) stillbirth, five (1.5%) neonatal death, two (0.6%) congenital hydrocephalous, two (0.6%) respiratory distress syndrome and two (0.6%) babies developed meconium aspiration syndrome.

## DISCUSSION

In this study, 264 (76%) women were in the age group of 20-34 years with mean age of 23± 4.29 years, age less than 19 years were 55 (16.8%) and age more than 35 years were found in eight (2.5%). Muhammad et al<sup>4</sup> found that 120 (80%) women were in the age group of 20-30 years, 129 (86%) were below the age of 30 years and 21 (14%) were above the age of 30 years. 208 (63.6%) were primigravidae and 109 (33.4%) multigravidae and 10 (3%) were grand multigravidae in this study. In contrast to this study, Mamoon et al<sup>6</sup> showed that 116 (21.40%) were primigravidae, 207 (38.19%) multigravidae and 219 (40.41%) were grand multigravidae.

Among indications of CS, The foetal distress was present in 139 (42.6%) women, failed induction in 49 (15%), abnormal presentation in 48 (14.6%), severe oligohydramnion in 26 (8%), non-progress of labour in 16 (5%) and cephalopelvic disproportion in 12 (5%) women. Nwosu et al<sup>7</sup> reported that cephalopelvic disproportion with or without obstructed labour was seen in 528 (42%) women, antepartum haemorrhage

in 189 (15.1%), foetal distress in 174 (13.9%), hand prolapsed and transverse lie in 43 (3.4%) and breech in 26 (2.1%) women.

In this study, 315 (96.43%) women had no maternal complications, seven (2.1%) women developed wound infections, two (0.61%) uterine rupture, one (0.3%) post partum haemorrhage, one (0.3%) post partum eclampsia and one (0.3%) developed puerperal pyrexia. There was no maternal mortality among CEmOC clients during study period. Rehana et al<sup>8</sup> revealed that 21 (11.8%) women developed wound infection, nine (5%) had massive haemorrhage, caesarean hysterectomy was done in three (1.69%) women having massive haemorrhage and there was one maternal death due to disseminated intravascular coagulation.

The mean birth weight of babies was 3160± 455 grams with minimum weight of 1400 grams and maximum weight of 4800 grams. There were 64 (19.1%) babies who had low birth weight and five (1.5%) babies had weight ≥ 4000 grams. Roy et al<sup>9</sup> found that the mean birth weight of babies underwent cesarean section for suspected foetal distress was 2805 ± 350grams. Mean age was 3300grams in the study conducted by Nwosu et al<sup>7</sup>.

APGAR scores at five minutes was > 5/10 in 298 (89.2%) babies, >3 to ≤5/10 in 21 (6.3%) babies, ≤3/10 in eight (2.5%) babies and 0/10 in seven (2%) babies. Nwosu et al<sup>7</sup> reported that APGAR score at five minutes was >7 /10 in 26.2%, 4-6/10 in 46.3% and 1-3/10 in 7.5%. Nuaim et al<sup>10</sup> reported that there were 91.4% babies had APGAR score ≥7/10 and 8.5% babies had APGAR score <6/10 among emergency cesarean section group.

In this study, 299 (89.5%) babies had no neonatal complications, 10 (3%) developed birth asphyxia, seven (2%) neonatal sepsis, seven (2%) still birth, five (1.5%) early neonatal death, two (0.6%) congenital hydrocephalous, two (0.6%) respiratory distress syndrome and two (0.6%) babies developed meconium aspiration syndrome. Ezechi et al<sup>11</sup> revealed that there were 6.9% perinatal mortality among caesarean section in South Western Nigeria, out of which 60.3% were still birth and 39.7% were early neonatal death.

## CONCLUSIONS

The most common indication of caesarean section was foetal distress. Majority of women had no maternal complications and there was no maternal mortality during study period. Majority of babies had no neonatal complications with minimal perinatal mortality. Better antenatal care and better BEmOC reduce caesarean section rate. Providing CEmOC in district level is the vital measure in safe motherhood for reducing maternal and perinatal morbidities and mortalities. But for better maternal and perinatal

outcome, there should be adequate manpower in maternity ward and operation theatre, adequate infrastructures in preoperative, operative and postoperative wards, blood bank and neonatal high dependency unit for CEmOC.

## DISCLOSURE

The authors report no conflicts of interest in this work.

No violation of human rights and safety.

Funding: Nil

## REFERENCES

1. Department of community medicine and family planning IOM. Final report. Study on utilization of family emergency obstetric care-EmOC in selected district of Nepal; August 2004.
2. UNICEF health section program division. Innovative approaches to maternal and newborn health. Compendium of case studies; August 2013:36.
3. Joyce Abbatt. Nepal safer motherhood project. Challenges to reducing maternal mortality: experiences from three districts in the Nepal; August 1999; 176/96/DFID; 7-8.
4. Ali M, Ahmad M, Rashida H. Maternal and fetal outcome comparison between emergency caesarean section versus elective caesarean section. *Professional Med J*. 2005;12(1):32-9.
5. Pitsawong C, Panichkul P. Risk factors associated with birth asphyxia in Phramongkutklao hospital. *The Journal of Obstetrics and Gynaecology*. 2011;19(4):165-71.
6. Mamoona R, Shaffiq A. An audit of caesarean section and its perinatal outcome. *JPMI*. 1994;8(2):29-33.
7. Nwosu C, Agumor K, Aboyeji AP, Ijaiya MA. Outcome of caesarean section in a sub-urban secondary health care facility in Nigeria. *Niger Med Pract*. 2004;46(7):77-9.
8. Najam R, Sharma R. Maternal and fetal outcomes in elective and emergency caesarean section at a teaching hospital in North India-a retrospective study. *J Adv Res Biol Sci*. 2013;5(1):5-9.
9. Raj KK, Baruah J, Kumar S, Deorwa AK, Sharma JB, Karmakar J. Caesarean section for suspected foetal birth asphyxia, continuous fetal heart monitoring and decision to delivery time. *Indian Journal of Paediatrics*. 2008;75(12):1249-52.
10. Nuaim LA, Seltain MH, Khashoggi T, Addar M, Chowdhary N, Adelusi B. Outcome in elective and emergency caesarean section a comparative study. *Ann Saudi Med*. 1996;16(6):645-9.
11. Ezechi OC, Loto OM, Ndububa I, Okogbo FO, Ezeobi PM, Nwokoro LA. Caesarean section and perinatal mortality in south western Nigeria. *NJOG*. 2009;4(1):46-8.