International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2022; 6(1): 240-244
Received: 25-11-2021
Accepted: 27-12-2021

Dr. Itishree Panda
Senior Resident , Department of Obstetrics & Gynaecology, Gauhati Medical College and Hospital, Guwahati, Assam, India

Dr. Panchanan Das
Professor and Head, Department of Obstetrics & Gynaecology, Gauhati Medical College and Hospital, Guwahati, Assam, India

Dr. Karuna Kanta Das
Associate Professor, Department of Obstetrics & Gynaecology, Gauhati Medical College and Hospital, Guwahati, Assam, India

Corresponding Author:
Dr. Itishree Panda
Senior Resident , Department of Obstetrics & Gynaecology, Gauhati Medical College and Hospital, Guwahati, Assam, India

Factors affecting fetomaternal outcome in obstructed labor: A tertiary care centre experience in North East India

Dr. Itishree Panda, Dr. Panchanan Das and Dr. Karuna Kanta Das

DOI: https://doi.org/10.33545/gynae.2022.v6.i1d.1149

Abstract
Objective: Obstructed labor comprises one of the five major causes of maternal mortality and morbidity in developing countries. Perinatal asphyxia due to obstructed labor not only lead to neonatal deaths, also accounts for a significant proportion of stillbirths. This study has been done to assess socioeconomic factors, clinical profile and to evaluate fetomaternal outcome in obstructed labor cases from a developing country perspective.
Study design: This hospital based observational study was conducted at Gauhati medical college and hospital (GMCH), Guwahati, India for one year. All the obstructed labor cases admitted during this period (1st June 2019 to 31st May 2020) were enrolled in the study and evaluated.
Results: Out of total 18768 deliveries 210 cases were diagnosed as obstructed labor, incidence being 1.12%. The mean age of our study population was 22.4 ± 5.4 years. Majority patients were from rural areas (89.50%), belonged to lower middle socioeconomic class (60.9%). Unbooked cases comprised 80% of the study population. Mean duration of stay in referral center before being referred to our institution was 22.1 ± 5.6 hours. Most common cause of obstructed labor was cephalopelvic disproportion (CPD) (57.6%). Incidence of CPD was significantly higher in nulliparous cases (p value <0.0001) whereas incidence of malposition and malpresentation was significantly higher in multiparous (p value <0.0001). Sepsis was the commonest maternal complication (36.2%) and birth asphyxia was the commonest neonatal complication (44.64%).
Conclusion: Lack of patient's education, inadequate antenatal care and skills in the peripheral health care setup along with poor referral facilities are responsible for most cases of obstructed labor in our study.

Keywords: Obstructed labor, cephalopelvic disproportion, maternal mortality, developing country

Introduction
Neglected obstructed labor (OL) is a major cause of both maternal and fetal morbidity and mortality. OL is a preventable obstetric complication resulting from combination of multiple factors like lack of education, negligent attitude, lack of awareness and without timely routine follow up. These are compounded by poverty, under nutrition, small pelvis, readily unavailable health services and lack of timely interventions by skilled personnel especially in a developing country like India. Social stigma, racial predisposition, gender disparity and early age of marriage can also complicate the scenario especially in a rural population.
Obstructed labor accounts for 2.8% of all maternal deaths globally [1]. It is grossly underestimated globally because deaths due to obstructed labor are often attributed and classified as complications associated with obstructed labor such as sepsis, postpartum haemorrhage or ruptured uterus [2]. Although specific Indian data is not available, as per global estimate for the year 2017, maternal death is highly prevalent in developing countries like India. Maternal mortality trend data from WHO reveals India along with Nigeria have the highest maternal mortality ratio (MMR) accounting approximately one third (35%) of estimated global maternal death burden (23% and 12% of global maternal deaths from Nigeria and India respectively) in 2017 [3].
OL is defined as "inability of the fetus to descend through the pelvis in spite of strong uterine contractions because of an insurmountable barrier preventing its descent". The most common site of obstruction being the pelvic brim, but can occur in the cavity or at the outlet of the pelvis [2]. OL comprises one of the five major causes of maternal mortality and morbidity in developing countries [4-5].

Intrapartum causes contributes 19.2% of neonatal mortality [6-7]. Intrapartum-related conditions or perinatal asphyxia due to OL not only leads to neonatal deaths, but also accounts for a significant proportion of stillbirths [8].

There are limited studies in our setup to evaluate the maternal and fetal outcome in obstructed labor. We undertook this study to assess socioeconomic and clinical profile of patients presenting with obstructed labor and to assess fetomaternal outcome in these cases from a developing country perspective. We analysed different parameters of obstructed labor, like its incidence, etiology, management, and complications. Our study can help in formulating a positive strategy to prevent obstructed labor and its consequences in India.

Materials and Methods

This prospective observational study was conducted at Gauhati medical college and hospital (GMCH), Guwahati, Assam, India over one year (from 1st June 2019 to 31st May 2020). All the obstructed labor cases (as per inclusion criteria) admitted during this period were evaluated with detailed history, socio-demographic details, and clinical profile. Parity, previous obstetric history, antenatal care, duration of labor, details of referral history was recorded. Any intrapartum or postpartum complications were noted. Death occurring as a consequence of obstructed labor was noted. Diagnosis of living or asphyxiated fetus was done by taking Apgar score at 1 minute and 5 minutes following birth. Any neonatal death was noted. Data analysis and statistical analysis was done using Epi Info software (Version 3.5.1) by applying Chi square test. *P* value <0.05 was considered as significant.

Inclusion criteria:

Patients were diagnosed as having obstructed labor using guidelines of American College of Obstetricians and Gynaecologists (ACOG) for prolonged labor and arrest of labor [9]. In addition to this patients with one or more of the following features formed the basis of diagnosis of obstructed labor in our study [2].

A) Signs of obstructed labor based on General Condition

- Exhausted and anxious patients in labor with or without rise in pulse rate (≥100 per minute), rise in respiratory rate (≥30 per minute), low blood pressure and/or with diminished urinary output, dehydration (sunken eyes, thirsty, dry mouth, dry skin identified by skin pinch going back slowly) and ketoacidosis.
- Rise in body temperature.

B) Signs of obstructed labor that may be revealed by abdominal examination

- Distended lower uterine segment.
- Bandl's ring (ridge at the junction of upper and lower uterine segment).
- Tonic contraction of uterus with or without tenderness on abdominal palpation (although if a woman has been in labor for a long time, contractions may have stopped because of uterine exhaustion especially in primigravida).
- Both poles of the fetal head may be felt above the pelvic brim in case of cephalic presentation and in malpresentation, presenting part may be high up.
- In late obstructed labor cases along with grossly retracted upper uterine segment, round ligaments may also be palpated abdominally.

C) Signs of obstruction that may be found on vaginal examination are

- Oedematous vulva, especially if the woman has been bearing down for a long time.
- Hot and dry vagina.
- Oedematous cervix with incomplete dilatation of the cervix (may be fully dilated in case of outlet obstruction).
- Large caput succedaneum, excessively moulded head may be felt in case of cephalic presentation or other causes of obstruction, e.g. shoulder, brow or face presentation, prolapsed arm may be felt.
- Foul-smelling meconium draining.
- Amniotic fluid may be already drained out.
- Catheterization may produce blood stained concentrated urine.

Exclusion criteria

Patients with features of obstructed labor associated with other obstetric complications (preeclampsia, gestational diabetes mellitus) and medical illnesses and patients with previous caesarean section were excluded from the study.

Results

During the study period, there were total 18768 deliveries in our institute out of which 210 cases were diagnosed as obstructed labor with an incidence of 1.12%.

The baseline sociodemographic characteristics are presented in Table 1. The mean age of our study population was 22.4 (± 5.4 SD) years. Majority of mothers (121cases, 57.62%) were less than 20 years of age. Most of the patients belonged to lower middle socioeconomic class (60.9%), followed by upper lower (24.8%), lower (12.4%) and upper middle (1.9%) socioeconomic class. As per modified Kuppuswamy socioeconomic status scale 2019, none of the cases were from upper class. Rural population contributed 188 (89.50%) of the cases and 22 (10.50%) cases were from urban areas. All patients were married and referred cases.

Obstetrical characteristics of the women in the study population is depicted in Table 2. Out of 210 cases, 42 (80%) cases had less than three visits for antenatal check-up at a heath care centre (Unbooked case), while 168 (20%) cases had a minimum of three visits for antenatal check-up after she was registered and confirmed to be pregnant (Booked case). Unbooked cases had more stillbirths (95.24%) with p value of 0.005. Primipara cases comprised 115 (54.8%), parity 1-3 comprised 75 (35.7%) cases, while grand multipara (parity ≥4) contributed 20 (9.5%) of the study population. The mean duration of labor among mothers was 22.8 ± 5.6 hours. While 136 (64.76%) patients stayed in referral health center for equal to or more than 18 hours before being referred to GMCH, the mean duration of stay was 22.1 ± 5.6 hours.

The different causes of obstructed labor is shown in Table 3. Most common cause of obstructed labor in our study was cephalopelvic disproportion (121 cases, 57.62%), followed by malposition (58 cases, 27.62%), malpresentation (23 cases, 10.95%), fetal congenital malformations (6 cases, 2.86%) and large cervical fibroid (2 cases, 0.95%). Malposition commonly noted in this study was occipito-posterior (37 cases, 17.6%) followed by deep transverse arrest (21 cases, 10%) whereas most common malpresentation was face presentation (10 cases, 4.76%) followed by brow (5 cases, 2.4%), breech presentation (4 cases, 1.9%) and shoulder presentation (4 cases, 1.9%). Fetal congenital malformations causing obstructed labor were

hydrocephalus seen in 4 babies while fetal ascites was found in 2 babies. Incidence of cephalopelvic disproportion was significantly higher in primipara cases whereas incidence of malposition and malpresentation were significantly higher in multipara.

As shown in Table 4, most common maternal complication in our study was sepsis (76 cases, 36.2%) [pyrexia (45), urinary tract infection (20) and wound Discharge (11)], followed by postpartum haemorrhage (55 cases, 26.2%), sub involution (42 cases, 20%), abdominal distension (39 cases, 18.6%), rupture uterus (14 cases, 6.7%), haemorrhagic shock (10 cases, 4.8%), bladder injury (10 cases, 4.8%) and broad ligament hematoma (6 cases, 2.8%). There were 3 (1.4%) maternal deaths (all due to urosepsis). Eighteen cases had uneventful post-partum recovery without any complications.

Incidence of PPH was significantly higher in multiparous cases. Abdominal distension and sepsis were significantly higher in nulliparous cases. 135 (64.29%) patients were discharged from hospital in < 7 days of admission, 63 (30%) patients stayed in hospital for 7-14 days and 9 (4.3%) patients stayed in hospital for > 14days. Eighteen patients had uneventful postpartum recovery without any above mentioned complications.

Total live births were 168 (80%) and 42 (20%) were stillborn. Maximum numbers of stillbirths (73.8%) were seen in < 20 years (p value 0.02). Out of 168 live babies, 35 were healthy and did not develop any complications. Rest 133 had different spectrum of complications as shown in Table 5.

Of all the babies, 122 (58.10%) had birth weight between 3.5-3.9 kg, 64 (30.48%) between 3.0-3.4 kg, 9 (4.28%) between 2.5-2.9 kg while 15 (7.14%) had birth weight ≥ 4 kg.

Table 6 shows association between parity and baby outcome and between parity and mode of delivery. Greater number of stillbirths (80.95%) were noted in multipara cases compared to primipara (p value < 0.0001). Majority of the cases (91.4%) were terminated by lower segment caesarean section. Rate of caesarean section was found to be more in primipara cases while incidence of destructive operation was more in multipara. Destructive operations were done in 4 (1.9%) patients [Craniotomy (3 cases) while evisceration (1 case)]. Rupture uterus was found in 14 cases, out of which 10 cases were recorded in multiparous woman while 4 cases were recorded in nulliparous woman. Repair of rupture uterus was done in 6 patients, while subtotal hysterectomy was done in 8 patients.

Table 1: Socio-demographic characteristics of the women

Variable	Values (n = 210)
Age in years	
<20	121 (57.62%)
20-30	65 (30.95%)
>30	24 (11.43%)
Residence	
Rural	188 (89.5%)
Urban	22 (10.5%)
Socioeconomic status	
Upper	-
Upper middle	4 (1.9%)
Lower middle	128 (60.9%)
Upper lower	52 (24.8%)
Lower	26 (12.4%)
Marital status	
Married	210 (100%)
Unmarried	-
Referral site	
Referred from Primary Health Center (PHC)	104 (49.5%)
Referred from Community Health Center (CHC)	88 (41.9%)
Referred from First Referral Unit (FRU)	18 (8.6%)
Direct coming (not referred)	-

Table 2: Obstetrical characteristics of the women

Variable	Values (n = 210)
Antenatal booking status	
Booked	42 (20%)
Unbooked	168 (80%)
Parity	
0	115 (54.8%)
1-3	75 (35.7%)
≥4	20 (9.5%)
Total duration of labor in hours	
<18	69 (32.86%)
≥18	141 (67.14%)
Duration of stay in health center before referral	
<18	74 (35.24%)
≥18	136 (64.76%)

Table 3: Distribution of causes of obstructed labor according to parity

Causes	Nulliparous (n=115)	Multiparous (n=95)	P value
Cephalopelvic disproportion	90 (78.26%)	31(32.63%)	<0.0001
Malposition	15(13.04%)	43(45.26%)	<0.0001
Malpresentation	7(6.09%)	16(16.84%)	<0.02
Fetal congenital malformation	3(2.61%)	3(3.16%)	0.81
Cervical myoma	0(0)	2(2.11%)	0.39

Table 4: Showing distribution of maternal complications according to parity

Maternal complications	Nulliparous	Multiparous	P value
Sepsis	49(42.6%)	27(28.4%)	0.04
Postpartum hemorrhage	14(12.2%)	41(43.1%)	0.001
Shock	6(5.2%)	4(4.2%)	0.78
Sub involution of uterus	35(30.4%)	7(7.4%)	0.06
Bladder injury	4(3.5%)	6(6.3%)	0.48
Abdominal distension	31(26.9%)	8(8.4%)	0.03
Broad ligament hematoma	1(0.9%)	5(5.3%)	0.12
Rupture uterus	4(3.48%)	10(10.53%)	0.06

Table 5: Fetal and neonatal complications

Complications	Number	Percentage (out of all live birth, n=168)	Neonatal death
Birth asphyxia	75	44.64%	8
Meconium aspiration syndrome	32	19.05%	2
Neonatal jaundice	18	10.71%	1
Septicemia	6	3.57%	3
Convulsion	2	1.19%	0

Table 6: Showing association between parity and mode of delivery and baby outcome

	Baby outcome	
	Live birth (n=168)	**Stillbirth (n=42)**
Nulliparous (n=115)	107 (63.69%)	8 (19.05%)
Multiparous (n=95)	61 (36.31%)	34 (80.95%)
	Mode of delivery	
	LSCS	Destructive operation
Nulliparous (n=111)*	109 (98.2%)	2 (1.8%)
Multiparous (n=85)*	83 (97.6%)	2 (2.4%)

*14 cases of rupture uterus (10 cases seen in multiparous women and 4 cases seen in nulliparous) were excluded.

Discussion

The incidence of obstructed labor in our study was 1.12% which was lower than some of the studies done in other different parts of India (1.18% by Mathuriya *et al.*, 1.6% by Bansal *et al.* and 1.71% by Rizvi *et al.*) [10-12]. As per data from Government of India, Assam (North Eastern state of India) has the highest MMR in India [13, 14]. OL being one of the five most common causes of maternal deaths we expected a higher incidence of OL in our study. Compared to the other studies, lower incidence in our study could possibly be due to under reporting, inadequate referral of OL cases from rural areas to our center, strict inclusion criteria and judicious exclusion of cases. Most of the above mentioned studies do not have any exclusion criteria. Most of the patients in our study were teenagers (57.62%) and from rural areas (89.5%) which is comparable to other studies [11, 12, 15]. This high incidence of OL in rural population can be attributed to early age of marriage, lack of health education amongst people of rural areas, delay in seeking medical care, lack of proper heath facilities in rural areas and unskilled birth attendants, not experienced enough to do proper pelvic examination and risk assessment are also the contributing factors for OL.

As per modified Kuppuswamy socioeconomic status scale, most of the cases (60.9%) belonged to lower middle socioeconomic class. Use of socioeconomic scale in a primary health care settings can help to predict the risk of developing OL in a specific population with respect to their socioeconomic class. Lower socioeconomic status, undernutrition, early age of conception can predispose to under developed pelvic bones and thus greater risk of OL in younger age group.

Majority (54.8%) patients were primipara with comparatively contracted pelvis which could not be detected in early labor in the referral center. Multipara women comprising 45.2% cases may be due to secondary contracted pelvis, fetopelvic disproportion or reduced pelvic and abdominal muscle tone with subsequent pregnancies causing abnormal feto pelvic axis resulting into malpresentation. The commonest cause of obstructed labor in our study was cephalopelvic disproportion comprising 121 (57.62%) cases followed by malposition seen in 58 cases (27.62%) and malpresentation noted in 23 cases (10.95%). Cephalopelvic disproportion was mostly detected in primipara cases while malposition and malpresentation were mostly seen in multipara cases. This may be due to laxity of abdominal wall muscles, obesity and lordosis which may lead to pendulous abdomen and contribute to malpresentation/malposition in multipara cases and ineffective bearing down effort during second stage of labor [16]. Most common mode of delivery in our study was caesarean section, done in 192 (91.4%) cases.

Most common maternal complication was sepsis which was reported in 76 (36.2%) cases followed by post-partum hemorrhage (26.2%), abdominal distension (18.6%), subinvolution of uterus (20%), rupture uterus (6.7%), hemorrhagic shock (4.8%), bladder injury (4.8%) and broad ligament hematoma (2.8%). Out of 14 cases of rupture uterus, 10 cases were found in multiparous woman while 4 cases were found in primiparous woman. In 2 primipara cases rupture uterus was due to injudicious use of oxytocics in the referral center while the other 2 primipara patients had history of multiple induced abortions by dilatation and evacuation. There were 3 (1.4%) maternal deaths in our study (all due to septicaemia), which was higher than study done by Mathuriya *et al.* (0.9%) in Western India and by Rizvi *et al.* (0.74%) in North India [10, 12]. Higher percentage of maternal deaths in our study could probably be due to difference in states at which the patient has admitted to the hospital or due to delay in initiation of appropriate management. Stillbirth rate in this study was 20%, while perinatal mortality was 26.66% which is comparatively higher than other studies done in India (17% by Mathuriya *et al.*, 22.68% by Mondal *et al.*) [10, 16]. Higher perinatal mortality in this study could be due to difference in status of neonates at admission to our institution, difference in skill in assessing Apgar score and difference in expertise in neonatal rescusitation.

Conclusion

Obstructed labor is a devastating situation for the patient and their family members with unpredictable fetal outcome. Education and training of traditional birth attendants regarding proper pelvic assessment and use of partogram to identify cases of prolonged labor with timely referral is suggested for early suspicion and prompt management of OL. Public education, awareness programmes and mass media emphasising the importance of regular antenatal visits especially in third trimester should be implemented. Strengthening the referral system, improving transportation access to rural areas must be emphasized. A uniform well designed simplified proforma and protocol must be implemented in all health care setups with prompt reporting and referral of OL cases so that a multicentric study involving data from primary health care centres can be incorporated.

Limitations of this study: This is a single institutional based study conducted at a tertiary care centre therefore the burden of the disease in peripheral health care centres has not been taken into consideration. The current study also did not investigate the cause of delayed referrals of OL cases.

Consent to participate: Informed consent was obtained from all individual participants included in the study.

Ethics approval: This study was done after prior approval from the Institutional Ethical Committee (Date: 18/03/2019, No: 190/2007/pt-11/MAR/2019/PG/79) and has been performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Reference

1. Getachew A, Wakgari N, Gishille T. Feto-Maternal Outcomes of Obstructed Labor and Associated Factors among Mothers Who Gave Birth in Public Hospitals of West Shoa Zone, Central Ethiopia: Cross-Sectional Study. Ethiop J Health Sci. 2021 May;31(3):467-474.
2. WHO | Managing prolonged and obstructed labour

[Internet]. WHO. World Health Organization; [cited 2020 Sep 9]. Available from: https://www.who.int/maternal_child_adolescent/documents/3_9241546662/en/
3. WHO | Maternal mortality: Levels and trends [Internet]. WHO. World Health Organization; [cited 2020 Sep 9]. Available from: http://www.who.int/reproductivehealth/publications/maternal-mortality-2000-2017/en/
4. Mahler H. The safe motherhood initiative: a call to action. Lancet. 1987 Mar 21;1(8534):668-70.
5. World Health Organization. Maternal mortality: ratios and rates: a tabulation of available information 3rd ed. World Health Organization, 1991. [Internet] [Cited 2020 sep 19] [about 99p] Available from: https://apps.who.int/iris/handle/10665/272290.
6. Liu L, Oza S, Hogan D, Perin J, Rudan I, Lawn JE *et al.* Global, regional, and national causes of child mortality in 2000–13, with projections to inform post-2015 priorities: an updated systematic analysis. Lancet 2015;385(9966):430-440.
7. Liu L, Johnson HL, Cousens S, Perin J, Scott S, Lawn JE *et al*. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. Lancet 2012;379:2151-2161.
8. Sankar MJ, Neogi SB, Sharma J, Chauhan M, Srivastava R, Prabhakar PK, *et al*. State of newborn health in India. J Perinatol. 2016 Dec;36(Suppl 3):S3–8.
9. American College of Obstetricians and Gynecologists (College), Society for Maternal-Fetal Medicine, Caughey AB, Cahill AG, Guise J-M, Rouse DJ. Safe prevention of the primary cesarean delivery. Am J Obstet Gynecol [Internet]. 2014. March;210(3):179-193.
10. Mathuriya DrG, Pandey DrS. Maternal and perinatal outcome in in obstructed labour in M.Y.H. Indore. Int J Clin Obstet Gynaecol. 2020 Jan1;4(1):46–9.
11. Kalra R. Feto maternal outcome in obstructed labor: a tertiary centre study. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2019; Jun 1:8.
12. Rizvi S, Gandotra N. Maternofetal outcome in obstructed labour in a tertiary care hospital. Int J Reprod Contracept Obstet Gynecol. 2015;1410-3.
13. Maternal Mortality Ratio (MMR) (per 100000 live births) | NITI Aayog [Internet].[cited 2020 Sep 9]. Available from: https://niti.gov.in/content/maternal-mortality-ratio-mmr-100000-live-births.
14. Special bulletin on maternal mortality in India, SRS, 2016-2018. [Internet].[cited 2020 Sep 9]. Available from: https://censusindia.gov.in/vital_statistics/SRS_Bulletins/MMR%20Bulletin%202016-18.pdf.
15. Dr.Sweta Lal, *et al*. "A Retrospective Observational Study of Foetomaternal Outcome of Obstructed Labour in a Tertiary Care Hospital." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS). 2020;19(6):14-18.
16. Mondal S, Chaudhuri A, Kamilya G, Santra D. Fetomaternal outcome in obstructed labor in a peripheral tertiary care hospital. Medical Journal of Dr DY Patil University. 2013; Apr 1;6(2):146.