International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Dulewad SS et al. Int J Reprod Contracept Obstet Gynecol. 2025 Oct;14(10):3373-3379
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20253079

Original Research Article

A clinical study on maternal and fetal outcomes of obstructed labour

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Received: 31 July 2025
Revised: 07 September 2025
Accepted: 10 September 2025

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ABSTRACT

Background: Obstructed labour is the failure of the fetal presenting part to descend in the birth canal despite adequate uterine contractions. This study aims to identify risk factors for obstructed labour and highlight strategies to reduce maternal and fetal morbidity and mortality.
Methods: This prospective cross-sectional study included all women with prolonged and obstructed labour at a tertiary hospital. Complete enumeration was used for sampling, and data were analysed using Microsoft excel.
Results: A total 48 patients were of the age of 18-25 years. 78 were primigravida. 32 patients needed operative vaginal delivery. In postpartum complications, 26 patients went into atonic PPH, 1 underwent laparotomy for rupture uterus,18 patients had extension of the uterine incision during LSCS and 8 patients suffered from vaginal lacerations. Postpartum complications such as anemia found in 34 cases, sepsis in 26 cases, paralytic ileus in 28 cases and surgical site infection in 12 patients. 21 patients had prolonged hospital stay. 8 babies died, 19 babies were still admitted in NICU and 75 were healthy.
Conclusions: Regular antenatal visits and pelvic evaluation beyond 37 weeks by an experienced gynaecologist are essential for diagnosing adequacy. Attendants at rural centres must be trained to monitor labour and identify prolonged labour using a partograph. Most obstructed labour cases are preventable if pregnant women receive proper antenatal care, births are attended by trained personnel, uterotonics are used appropriately, and instrumental vaginal deliveries are performed by expert gynaecologists when indicated.

Keywords: Obstructed labor, Pelvis adequacy, Partograph

INTRODUCTION

Obstructed labour (OL) is defined as a failure of the presenting part of the fetus to descend into the birth canal due to mechanical causes, despite having sufficient uterine contraction.[1,2] It is diagnosed when the duration of labour is more than 24 hours leading to the inability of a labouring mother to support herself, move her lower extremities to take an appropriate position for labour, and has deranged vital signs (because of dehydration and exhaustion), Bandle's ring is formed in the lower uterine segment, fetal distress or intra-uterine fetal demise, oedematous vulva, big caput, moulding of the fetal head, foul-smelling and thick meconium-stained amniotic fluid.[3]

Neglected obstructed labour is the main reason for both maternal and newborn morbidity and mortality. The obstruction can only be alleviated through operative delivery either caesarean section or other instrumental delivery (forceps, or vacuum extraction), which is necessary to improve maternal and fetal outcomes.[4] Globally, at least 585,000 women die each year from problems of pregnancy and childbirth. More than 70% of all maternal deaths are due to five major complications: haemorrhage, infection, unsafe abortion, hypertensive disorders of pregnancy, and obstructed labour.[5] Amongst these aetiologies, obstructed labour is one of the most common reasons for maternal and fetal morbidity and mortality in sub-Saharan Africa and Southeast Asia.

Obstructed labour affects 3-6% of labouring women in developing countries like India. The most common reason for obstructed labour is cephalon pelvic disproportion, a mismatch between the fetal head and the mother's pelvic brim. The fetus may be huge as compared to the maternal pelvic brim, such as the fetus of a diabetic woman, or the pelvis may be contracted, which is more common when malnutrition is predominant. Certain other reasons for obstructed labour may be malpresentation and malposition of the fetus (shoulder, brow, or occipito-posterior positions), deep transverse arrest, deflexed head, cord around neck, and cervical prolapse.

It is an indicator of inadequacy and poor quality of obstetric care and is the immediate cause of maternal and perinatal morbidity and mortality due to uterine rupture, complications of caesarean delivery, PPH, anaesthesia complications, and puerperal sepsis with fetal complications such as asphyxia and brain damage. Furthermore, neglected obstructed labour caused because of poverty-prohibiting high cost of maternal care in hospitals, ignorance, illiteracy, obstructed transportation, socio-cultural confidence to attain vaginal delivery at all costs, late referrals, and aversion to caesarean delivery and hospital delivery particularly after an earlier caesarean operation.[6] The fetus expires first, followed by the death of the mother which puts the survival of other children in the family in jeopardy. The maternal deaths happened in the poor, illiterate, hard-to-reach women who are living in rural areas with inadequate or no access to skilled birth attendants.[7] The risk of maternal demise after abdominal delivery in such a septic complaint can be very high.[8]

Other complications of abdominal delivery include sepsis and septic shock, anaemia, blood transfusion, wound infection, burst abdomen, prolonged hospital stay, high cost of care, infertility, aversion to hospital delivery, caesarean delivery in a succeeding pregnancy, obstetric fistulas, abandonment, and even divorce. Complications that have been attributed directly to fetal destructive vaginal operations include uterine rupture in 2.6-9.1% of cases, PPH in 4.5%, and cervical and vaginal lacerations in 1.3%.[9] Maternal and perinatal mortality and morbidity associated with obstructed labour are almost totally prevented in developed countries because of improved nutritional status, wide health coverage, adequate transportation and communication systems, obtainability of trained health personnel, optimal antenatal and intrapartum care, and other associated issues.[10]

Maternal health is the basic right of every woman in the reproductive years of her life. It includes the periods not only throughout pregnancy but also during childbirth and the postnatal period. It requires the facility of services for birth control, and antenatal, natal, and postpartum care. The provision of such services helps in reducing maternal morbidity and mortality.[11] The reported complications of pregnancy are very high (a woman dies from complications of childbirth approximately every minute) throughout the world.[12] The World Health Report for the year 2005 further highlighted that, poor maternal conditions accounted for the fourth leading cause of death for women worldwide, after HIV/AIDS, malaria, and tuberculosis.[13] The majority of maternal deaths and injuries are initiated by biological processes, not from disease, which can be stopped and have been mostly eradicated in the developed world. Worldwide, 50-71% of maternal mortality occurs during labour or in the post-partum period and a majority of these are avoidable.

OL continues to plague thousands of women each year. It accounts for about 8% of all maternal deaths in developing countries like India, and is the leading cause of hospitalization, comprising up to 39% of all obstetric patients in developing countries.[14,15] Obstructed labour is the single most important cause of maternal death (ranging between 1%-13%) and is one of the three leading causes of perinatal mortality (ranging between 74%-92%), with the case fatality rate of 87%–100%.[16-18] It is found to be directly or indirectly responsible for about half of all maternal deaths, affecting mainly primigravida and grand multipara.[19,20] Maternal deaths occur as a result of ruptured uterus as well as genital sepsis in women having undergone caesarean section done for obstructed labour.[18,21]

Each year, 210 million women become pregnant, of whom 20 million experience pregnancy-related illness, and 500,000 die as a result of complications from pregnancy or childbirth.[22] In 1987, the World Health Organization (WHO) launched the Safe Motherhood Initiative, which aimed to reduce maternal morbidity and mortality by 50% by the year 2000. The initiative did not succeed, but maternal health continues to be a main focus of WHO efforts. The WHO initiative was to reduce maternal mortality to 75% of the 1990 level by 2015.[23] If this is to be effective, the problem of obstructed labour needs to be addressed efficiently. Maternal mortality from obstructed labour is mostly the result of a ruptured uterus or puerperal infection, whereas perinatal mortality is mainly due to asphyxia. Significant maternal morbidity is associated with prolonged labour since both PPH and infection are more common in women with long labour. Obstetric fistulas are long-term problems. Traumatic delivery affects both mother and child.[22,23]

In most sub-Saharan countries as well as Ethiopia, women are conventionally expected to give birth at home which leads to delays in seeking medical attention during childbirth, even if complications arise. Moreover, women are often marginalized in decision-making regarding where and when to seek care.[24] Unofficial financial demands from healthcare workers lead to an aversion to maternal health facilities. Inadequately developed healthcare systems including poor infrastructure, poor transportation, and poor obstetric services are also major contributors to obstructed labour.[25] Obstructed labour has dissimilar magnitudes in different developing countries ranging from 2 to 8%. Apart from maternal deaths, OL had different maternal outcomes such as uterine rupture,

anaemia, PPH, puerperal sepsis, bladder injury, VVF, RVF, and poor fetal outcomes including birth asphyxia, stillbirth, neonatal jaundice, and umbilical sepsis.[26,27] By far, the greatest severe and distressing long-term condition subsequent to obstructed labour is obstetric fistula which causes serious social problems of divorce, separation from religious exercises, and detachment from their families that can worsen poverty and malnutrition.[27]

METHODS

This study follows a prospective cross-sectional design. The study population included all women presenting to the Obstetrics and Gynaecology labour room of Dr. Shankarrao Chavan Government Medical College and hospital, Nanded, with prolonged and obstructed labor. The study was done for 18 months, spanned from October 2022 to April 2024. Complete enumeration was used as the sampling technique.

Inclusion criteria

Full term pregnancy greater than 37 weeks. Single tone pregnancy. Multiparous women admitted with longer duration of labour pain, >18 hours. Pregnant female with previous 1 lower segment caesarean section

Exclusion criteria

Pregnant women in labour at less than 37 weeks (Preterm labour). Pregnant women with congenital fetal anomaly e.g. hydrops fetalis/ Anencephaly/ hydrocephalus. Pregnant women with multifetal pregnancy. Pregnant women with contracted pelvis. Pregnant women with previous 2 lower segment caesarean section.

Statistical analysis

Data collection was conducted at a time deemed convenient by the participants. No identifying information was recorded. Descriptive statistics is used to describe the sample characteristics. Frequencies and percentage are used for categorical variables. Microsoft excel was used for data analysis.

RESULTS

A total of 102 cases of prolonged and obstructed labor were taken in this study. Table 1 shows the age distribution of the cases, out of 102 patients, 48 (47.1%) patients aged 18-25 years. 26 (25.5%) patients aged 26 to 30 years. 28 patients (27.4%) aged between 31-40 years with obstructed labour were enrolled. In our study, mean age of patients was 18-25 years as it comprised 47.1% of the study populations.

Table 2 shows the parity status of the patients. Out of the 102 patients, 78 (76.6%) were primigravida. 10 of them (9.8%) were second gravida. 8 patients (7.8%) were third gravida. 2 patients (1.9%) were fourth gravida.4 patients (3.9%) were grand multipara i.e. conceived more than 4 times.

Table 1: Distribution according to age group.

Age group	No. of patients	Percentage (%)
18-25 years	48	47.1
26-30 years	26	25.5
31-40 years	28	27.4
Total	102	100

Table 2: Obstetric score.

Obstetric score	No. of patients	Percentage (%)
Primigravida	78	76.6
Second gravida	10	9.8
Third gravida	8	7.8
Fourth gravida	2	1.9
Grand multipara	4	3.9
Total	102	100

Table 3: Mode of delivery.

Mode of delivery	No. of patients	Percentage (%)
FTND	21	20.6
Outlet forceps	18	17.6
Ventouse	14	13.7
VBAC	5	4.9
LSCS	44	43.2
Total	102	100

Table 3 shows us the mode of delivery and also demonstrates the use of operative vaginal delivery. Out of the 102 patients of the study, 21 patients (20.6%) had a full term normal vaginal delivery without any assisted operative obstetrics. 18 (17.6%) of them required intervention by outlet forceps. 14 (13.7%) patients needed ventouse application for their delivery. 5 patients (4.9%) had vaginal birth after previous caesarean section without any assisted vaginal delivery and complications. 44 patients (43.2%) needed caesarean section for delivery of the baby.

Table 4 enlists the occurrence of intra-partum complications. Intra-partum complications are the complications faced during delivery of the baby and placenta, irrespective of the mode of delivery. Out of the 102 patients that underwent operative procedure for management of obstructed labour, 26 patients (25.5%) went into atonic PPH. Only 1 patient (0.9%) underwent laparotomy for rupture uterus. 18 patients (17.6%) had extension of the uterine incision while delivery of the fetus, this was seen during LSCS when the baby was delivered using Patwardhan or modified Patwardhan method. Of the patients who delivered vaginally, 8 patients

(7.9%) suffered from vaginal lacerations. 49 patients (48.1%) had no intra-partum complications.

Table 4: Occurrence of intra-partum complications.

Intra-partum complications	Number of patients	Percentage (%)
Atonic PPH	26	25.5
Rupture uterus	1	0.9
Extension of uterine incision in LSCS	18	17.6
Vaginal laceration	8	7.9
None	49	48.1
Total	102	100

Table 5 shows the list of multiple postpartum morbidities faced by the patient. Out of the 102 patients enrolled in this study, 7 of them (6.9%) presented only with anemia as a post operative complication. Major reason for this was atonic or traumatic PPH during delivery which caused acute severe blood loss. 8 of them (7.9%) had anemia along with sepsis, anemia being a precipitating factor for sepsis. 8 (7.9%) patients had anemia and sepsis leading to surgical site infection. 1 (1%) patient had surgical site infection along with paralytic ileus. The pus from the suture site was sent for culture. It was managed by twice daily thorough dressing of the wound and administering organism sensitive antibiotics according to the microbiology report. The wound was re-sutured once healthy granulation tissue appeared. 3 (2.9%) patients had anemia, sepsis and paralytic ileus. 6 (5.9%) patients had anemia with paralytic ileus. 2 of them (1.9%) had anemia causing scar site wound infection. 2 patients (1.9%) showed signs of sepsis in the post-natal period, this was managed by using broad spectrum higher antibiotics. 14 (13.7%) patients complained of gaseous abdominal distention due to delayed bowel movements. They were kept nil by mouth for 48 hours and adequate hydration was maintained via IV fluids, unless bowel sounds returned back to normal and patient passed flatus. 3 patients (2.9%) had sepsis which led to paralytic ileus. 1 (1%) patient had sepsis and paralytic ileus, this also led to suture site infection. 46 patients (45.1%) had no post-partum complications.

Table 5: Occurrence of post-partum complications.

Post operative complications	Number of patients	Percentage (%)
Anemia only	7	6.9
Sepsis only	3	2.9
Paralytic ileus only	14	13.7
Surgical site infection only	0	0
Anemia with sepsis	8	7.9
Anemia with paralytic ileus	6	5.9
Anemia, sepsis, surgical site infection	8	7.9
Sepsis with paralytic ileus	3	2.9
Sepsis, paralytic ileus, surgical site infection	1	1
Anemia, sepsis with paralytic ileus	3	2.9
Anemia with surgical site infection	2	1.9
Paralytic ileus with surgical site infection	1	1
None	46	45.1
Total	102	100

Table 6 shows the duration of hospital stay of the patient after delivery. Out of the 58 patients that underwent vaginal delivery, 52 (88.1%) were discharged within 24 hours of their delivery. 6 patients (11.9%) had prolonged stay in the hospital and were discharged within 3-4 days after their delivery. Out the 44 patients that underwent caesareans section, 15 (34.1%) experienced prolonged hospital stay. The remaining 29 patients (65.9%) were discharged within 5 days.

Table 6: Duration of stay in hospital.

Vaginal delivery			C- section		
Duration of stay	**Number of patients**	**Percentage**	**Duration of stay**	**Number of patients**	**Percentage**
Normal (<24 hours)	52	88.1	Normal (5 or <5 days)	29	65.9
Prolonged (>24hour)	6	11.9	Prolonged (>5 days)	15	34.1
Total	58	100	Total	44	100

Table 7: Baby status at the time of discharge.

Baby status	Number of babies	Percentage (%)
Healthy with mother	75	73.5
NICU	19	18.7
NND/IUD	8	7.8
Total	102	100

Table 7 shows baby status at the time of discharge. In the present study out of the 102 babies, 8 (7.8%) babies were dead at time of discharge (5 due to IUD and 3 due to neonatal death in NICU). 19 babies (18.7%) were still admitted in NICU for indications such as birth asphyxia, meconium aspiration syndrome and hypoxic ischemic encephalopathy. 75 babies (73.5%) were healthy and with their mothers at the time of discharge.

DISCUSSION

Obstructed labour is a life-threatening obstetrical complication associated with significant maternal as well as fetal morbidity and mortality. Early recognition and immediate interventions are important to prevent the associated complications and to improve maternal and fetal outcomes. Regular ANC visits, especially in the last trimester are essential. Clinical pelvimetry and pelvic adequacy should be assessed by a gynaecologist beyond 37 weeks. CPD must be ruled out before deciding for trial of labour. Several interventions, such as use of partograph to monitor labour, timely recognition of prolonged labour at rural health care centers, prompt and timely referrals to tertiary centers and provision of emergency obstetrical care services have been proposed to reduce the incidence of obstructed labour and its sequelae. Paediatricians are a must for neonatal resuscitation, as chances of perinatal morbidity are high due to birth asphyxia, meconium aspiration syndrome, and neonatal sepsis. But still prevalence remains high in developing countries. Perhaps the other factors such as malnutrition, insufficient ANC check-ups, reluctance to get C-section (by people living in rural areas) and variables seem to make obstructed labour a persistent and intractable condition unresponsive to interventions targeted at health facilities in developing countries. In our study, maximum cases of obstructed labour i.e. 48 (47.1%) were found in the age group of 18-25 years followed by 31-40 years which is 28 (27.4 %). Similar results were found by Rao BK which reported maximum cases of OL in the age group of 21-23 years. [28] Sarkar et al observed that the majority of cases of OL were in 18-21 years of age group.[29] Gupta et al found that 72.8% of such cases occur in the age group of 20-23 years.[30] This is due to custom of early marriage (14-16 years) among uneducated people living in rural area and high fertility in this young age group which is responsible for maximum confinement to occur at relatively younger age group and may explain the high incidence of OL in these age groups, as their pelvis may not be developed to adult potential.

In our study, the majority of patients, 78, (76.6 %) who were diagnosed as prolonged and obstructed labour were primigravida, this is supported by a lot of studies. Studies showing the higher incidence of obstructed labour in primigravida such as Ozumba et al.[31] Another study, Rizvi et al showed that the majority i.e 73.3% patients were primigravida.[32]

In our study, 58 (56.86 %) patients had full term vaginal delivery and 44 (43.13%) patients underwent lower segment caesarean section. Ngongo et al evaluated the mode of delivery in women with obstructed labour.[34] The caesarean section rate (54.8%) rose from 45% in 1990–94 to 64% in 2010-14. This increase occurred at the expense of assisted vaginal delivery (18.3%), which declined from 32% to 6%. The study concluded that in Eastern and Central Africa, the rate of caesarean section is progressively increasing in women with obstructed labour whose babies have already died in utero. Contrary to international recommendations, alternatives such as vacuum extraction, forceps and destructive delivery are decreasingly used. As per international recommendations, unless uterine rupture is suspected, caesarean section should be avoided in obstructed labour with intrauterine fetal death to avoid problems associated with CS scars in subsequent pregnancies.

In our study, the intra-partum complications faced were atonic PPH which was seen in 26 patients (25.5%). Only 1 patient (0.9%) underwent laparotomy for rupture uterus. 18 patients (17.6%) had extension of the uterine incision while delivery of the fetus during caesarean section, leading to traumatic PPH. Out of the 58 patients who delivered vaginally, 8 patients (7.9%) suffered from vaginal lacerations. To manage the intractable intra-partum bleeding in caesarean sections, bilateral uterine artery ligation done was done in 21 cases, bilateral anterior division of internal iliac artery was ligated in 8 cases along with B-Lynch compression sutures, which were taken in 10 cases of atonic PPH in our study.

In our study, post-natal complications such as anemia due to haemorrhage found in 34 (33.3%) cases, sepsis in 26 (25.5%) cases, paralytic ileus in 28 (26.5%) cases and surgical site infection seen in 12 (11.8%) patients. Similar complications are seen in Rizvi et al which also studied the complications of obstructed labour, the common maternal complications were sepsis [pyrexia] (15.1%), wound infections (12.8%), urinary tract infection (7%), paralytic ileus (11.2%), and PPH (9.7%).[32]

In our study, 81 (79.41%) cases hospital stay was normal while, 21 (21.59 %) cases need to stay in hospital for prolonged duration. Similar findings were seen in Bansal et al., where 28% of cases had longer stay more than 7 days at hospital.[33]

Out of the 102 patients, none underwent obstetric hysterectomy. 1 of the 102 patients had a ruptured uterus, which was repaired. In Mondal et al rupture uterus was seen in 8 (2.56%) cases, out of which hysterectomy was done in 5 cases and repair in 3 cases.[35] Due to timely referrals and prompt decisions taken at our centre, the incidence of rupture uterus was significantly less in my study.

In the present study out of the 102 babies, 8 (7.8%) had poor perinatal outcomes (5 IUD and 3 neonatal deaths in NICU). Out of the 5 IUDs, 4 were delivered vaginally and 1 by caesarean section as the pelvis wasn't adequate for

vaginal delivery. The cause of perinatal mortality is due to late referral from periphery hospitals and non-monitoring of progress of labour by partograph and NST. 19 babies (18.7%) continued to be admitted in NICU beyond discharge of their mothers for indications such as birth asphyxia, meconium aspiration syndrome and hypoxic ischemic encephalopathy. 75 babies (73.5%) were healthy and with their mothers. Similar perinatal outcome was seen in Rizvi et al., perinatal mortality was seen in 107 babies, (26.6%), live birth rate 316 (78.7%), stillbirth rate 86 (21.3%).[32] Perinatal morbidity was most commonly due to birth asphyxia (28.8%), jaundice (16.9%), septicaemia (14.75%), meconium aspiration syndrome (9.9%).

Limitation

The participants who withdrew consent weren't included in the study. Postpartum follow up of mother and child is limited, hence late maternal or neonatal complications cannot be fully assessed. The surgical decision -making reflects institutional resources and expertise. No control group, hence conclusions remain descriptive.

CONCLUSION

The prevalence of obstructed labour is still high in developing countries like India. Illiteracy and ignorance result in poor antenatal attendance and underutilization of the available facilities. Regular ANC visits and evaluation of pelvis beyond 37 weeks by an experienced gynaecologist is essential in diagnosing pelvis adequacy before deciding if trial of labour should be given. The attendants at rural centres must be trained to monitor progress of labour and identify prolonged labour with use of partograph. In modern day obstetrics, NST may be useful in all cases for good perinatal outcome. Improving nutrition right from childhood, discouraging high parity at young age group and improved utilization of available facilities, like instrumental vaginal deliveries will certainly contribute towards reducing incidence of obstructed labour. Most of the cases of obstructed labour are preventable provided all pregnant women receive proper antenatal care and all births are attended by trained person with the use of adequate uterotonics and use of instrumental vaginal deliveries by expert gynaecologists.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Dulewad SS, Gupta PK. A clinical study on maternal and fetal outcomes of obstructed labour. Int J Reprod Contracept Obstet Gynecol 2025;14:3373-9.