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Original Research Article

Feto maternal outcome in obstructed labor: a tertiary centre study

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ABSTRACT

Background: The number of maternal deaths as a result of obstructed labor is 8% globally but this number varies in developing country, it ranges 4-70% of all maternal deaths and it is also associated to high perinatal mortality rate. Objective of the study was to find out the proportion of obstructed labour cases and their feto-maternal outcome during last 3 years at tertiary level institute.

Methods: A cross sectional observation study was done at Department of Obstetrics and Gynecology, People's College of Medical Sciences and Research Centre Bhopal. All pregnant women presenting with obstructed labor who delivered at our hospital during last 3 years duration (January 2015 to December 2017) were studied for their feto - maternal outcome.

Results: 53% cases had duration of labor more than 16 hours. 84% were referred from primary health centers of nearby rural areas. All cases of obstructed labor delivered by cesarean section (100%). 44% were primigravida. 72% of cases had Cephalopelvic disproportion as the cause. 28% of cases had longer stay more than 7 days at hospital. 32% had fever during post operative period 12.5% cases had wound sepsis and 6% of cases required re-suturing of wound during post operative period. 72% baby's birth weight was between 3 to 3.4 kg. 94% of the babies survived where as 6% of babies were still birth. 16% of babies born to obstructed labor mother had APGAR less than 7 at 5 minutes of birth. 6% fetus were IUFD.

Conclusions: Cephalopelvic disproportion was the most common cause for obstructed labor. Timely identification of prolonged labor and timely referral and management at place where operation theatre, NICU and blood bank facilities are available can save the life of both baby and mother.

Keywords: Fetal death, Maternal morbidity, Obstructed labor, Postnatal complications

INTRODUCTION

George Dunea and Einar Perman reported a historical event "Princess Charlotte became pregnant in early 1817 at the age of 21, having miscarried twice in the previous year. She survived being starved and occasionally bled by her doctors according to the misguided practices of the time. The delivery itself was protracted, her cervix slows to dilate, the baby large and in a transverse position, the royal physicians adhering to the school of thought that

avored a conservative approach and brooked no intervention. Exhausted, deprived of analgesics according to the practice of the day, she delivered a dead fetus after 50 hours in labor and died soon thereafter from postpartum hemorrhage.

Even according to the medical standards of the time the case was considered to have been mishandled, and two years later her physician committed suicide."¹ This royal case signifies the grave outcome of obstructed labor. As

per WHO obstructed labour ‘the presenting part to the fetus is not able to pass into the birth canal despite strong uterine contractions’.²

The number of maternal deaths as a result of obstructed labour is 8% globally but this number varies in developing country, it ranges 4-70% of all maternal deaths and it is also associated to high prenatal mortality rate. Ranjana and Anjana reported in their study done 2017 incidence of obstructed labor as 8.9%.³⁻⁵

Objective of the study was to find out the proportion of obstructed labour cases and their clinical profile and foeto-maternal outcome during last 3 years at tertiary level institute. To study the proportion of cases of obstructed labor in last 3 years at tertiary care centre. To study maternal clinical profile and foeto maternal outcome in the obstructed labor cases delivering at the Institute during study period.

METHODS

A cross sectional observation study was done at Department of Obstetrics and Gynecology, People’s College of Medical Sciences and Research Centre Bhopal. All pregnant women who had features of obstructed labor and delivered at our hospital during last 3 years duration (January 2015 to December 2017) were studied for their clinical profile and foeto-maternal outcome.

The study variables for maternal profile and outcome were

- Duration of labor trial
- Place of labor trial
- Mode of delivery (LSCS/Ventuse/Forceps)
- Parity of patients
- Causes of obstruction
- Blood components required for transfusion
- Postnatal occurrence of sepsis (criteria-Fever/Wound sepsis/Wound re-suturing)
- Duration of hospital stay.

To study variables for the fetal outcome were

- Birth weight
 - APGAR Score at 5 min.
 - NICU admission
 - Ventilator supports
 - Duration of stay in NICU
 - Neonatal outcome at discharge - Alive /died Fischer
- Exact test was used for statistical calculation.

Inclusion criteria

- All pregnant women in labor with features of obstructed labor Features suggesting obstructed labor which were taken into consideration were -

Duration of active phase of labor longer than >12 hours in Primi -gravida and 8 hours in multi gravida was criteria for prolonged first stage of labour. Prolonged second stage is more than 1hour in multi gravida and 2 hours in Primigravida

- Those patients with prolonged labour and having maternal distress with signs and symptoms of maternal exhaustion, dehydration, keto acidosis, Maternal signs shows Pulse >100 beats /min, raised body temperature, concentrated urine. On examination of abdomen Bandl’s ring formation may be seen. On perineal examination Vulval oedema is present, vagina is hot and dry. Pelvic examination may reveals fetal caput.

Exclusion criteria

- All pregnant women who delivered (both vaginal and cesarean section) at our hospital without features of obstructed labor.

RESULTS

The proportion of obstructed labor cases delivered during 3 years of study period from 1st January 2015 till 31st December 2017 at our tertiary level institute were 32 cases of obstructed labor and 1963 cases were non obstructed deliveries. Thus proportion of obstructed labor was 1.6.

Duration of labor trial

Of all the cases of obstructed labor 16% cases had labor trial for less than 8 hours. 31% cases had duration of trial between 8-16 hours and 53% cases had duration of trail more than 16 hours (Figure 1). Hence the range of duration of labor trial was from 8 hours to 16 hours in which more than half of the labor trials were of 16 hours and more duration.

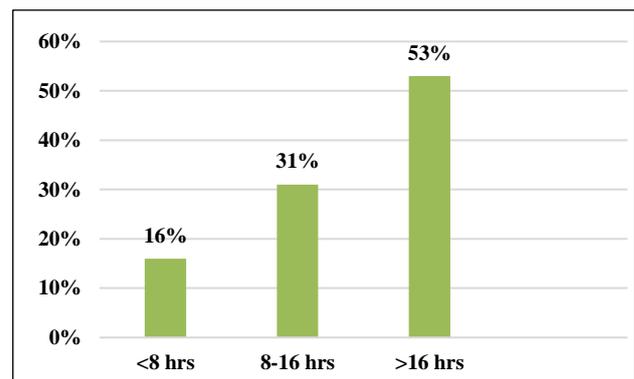


Figure 1: Duration of labor trial.

Place of labor trial

All the cases of obstructed labor were referral cases. 84% were referred from primary health centers of nearby rural areas which suggests that more than two thirds of

obstructed cases were referred from primary health centers. Rest 16% i.e. less than 1/3rd of the cases were referred from local hospitals (Figure 2).

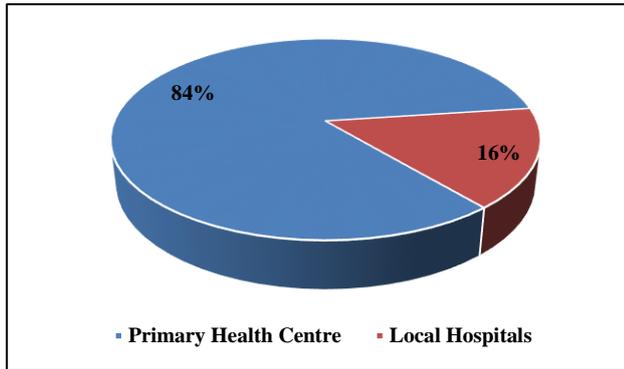


Figure 2: Place of labor trial.

Mode of delivery (LSCS/Ventuse/forceps)

All cases of obstructed labor delivered by caesarean section. (100%) at our institute. There was no maternal mortality.

Parity of cases with obstructed labor

About 44% were primigravida, 41% cases were para 2 and para 3 and rest of 15% cases were para 4 and above. Least no. of cases were of para 4 and above whereas almost equal no. of cases were of primigravida and para 2 and 3 (Figure 3).

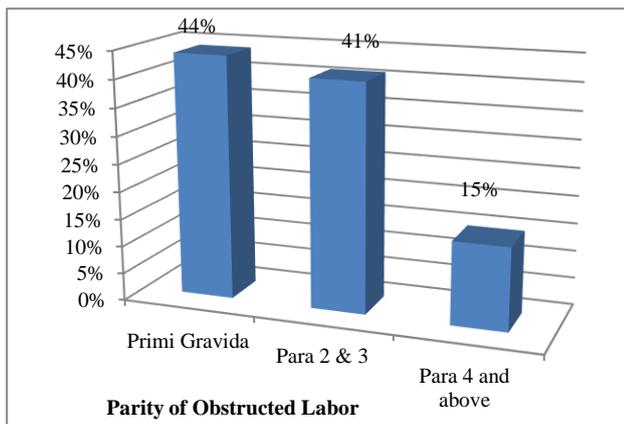


Figure 3: Parity distribution of obstructed labor cases.

Causes of obstruction

About 72% of cases had Cephalopelvic disproportion, Malposition was the cause in 28% cases commonest being occipito posterior position with deep transverse arrest. Therefore almost 2/3rd of cases had cephalopelvic disproportion whereas around 1/4th cases had malposition common being occipitoposterior position (Figure 4).

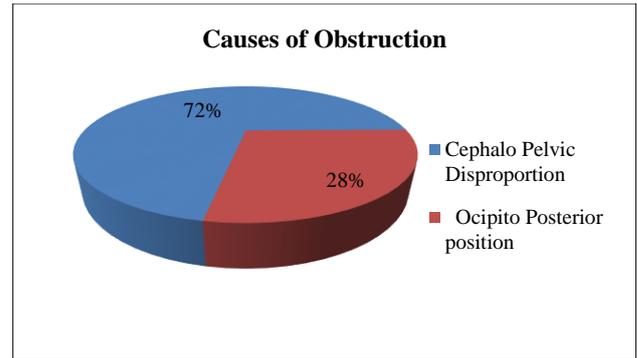


Figure 4: Causes of obstructed labor

Blood components required for transfusion

Only 16% cases required blood and blood components and rest of 84% of the cases did not required. Hence a very less number of cases required blood and blood components (Figure 5).

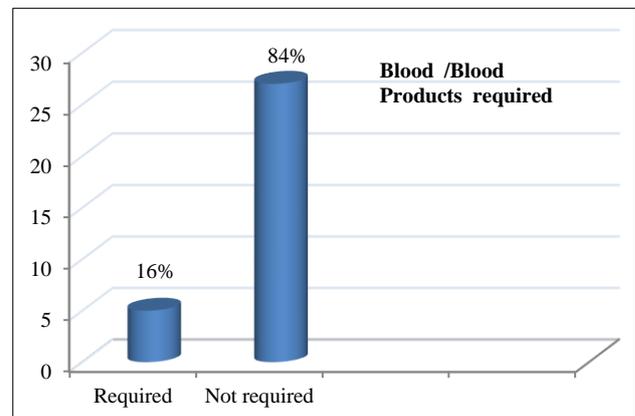


Figure 5: Blood products required.

Hospital stay

About 28% of cases had longer stay which was more than 7 days at hospital and 72% cases stay was 7 days or less. Most of the cases had normal stay of less than 7 days whereas around 1/4th cases required a stay of more than 7 days at hospital (Figure 6).

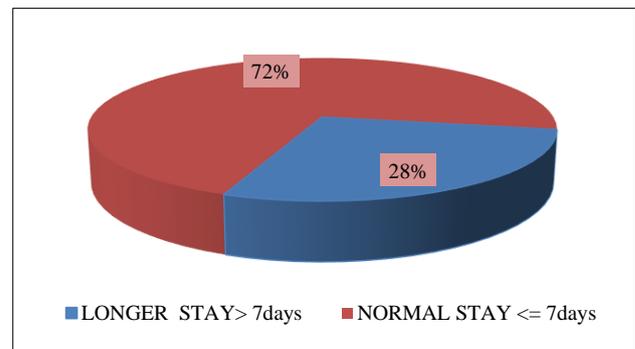


Figure 6: Hospital stay duration.

Occurrence of postnatal complications

About 32% had developed fever during post operative period 12.5% cases had wound sepsis and 6% of cases required re-suturing of wound during post operative period. Overall 50.5% cases had some kind of complication during postnatal period in which highest number of cases had fever as a postnatal complication followed by wound sepsis (Figure 7).

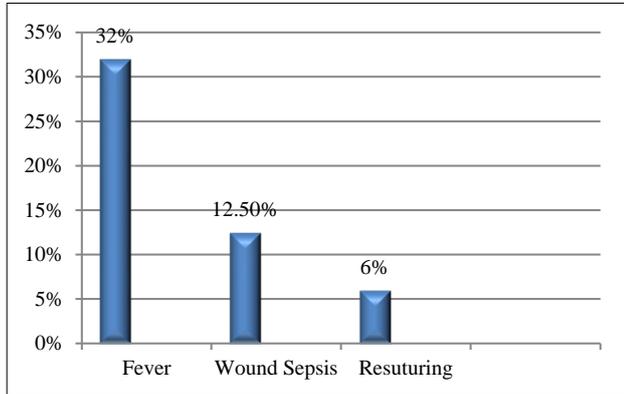


Figure 7: Incidence of post natal sepsis.

Age distribution of cases

Out of total cases 7 cases (21.8%) were between 18-23 age group, 20 cases (62.5%) were between 24-29 years age group, 5 cases (15.6%) were between 30-35 years age group. Hence most of the cases were between 24-29 years age group while least no. of cases belong to 30-35 years age group (Figure 8).

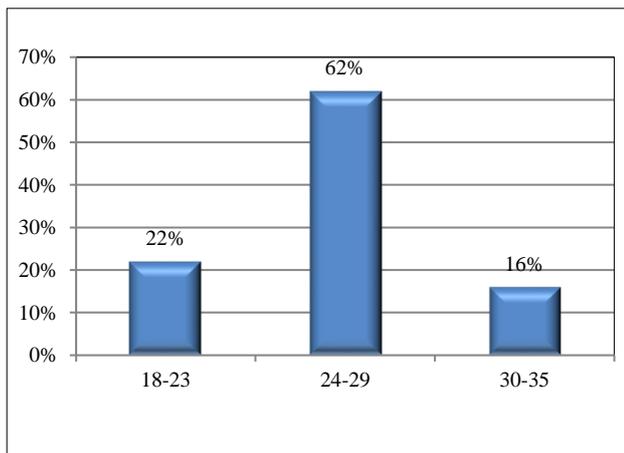


Figure 8: Age distribution of obstructed labor cases.

Baby weight distributions

About 19% babies had birth weight between 2.5 to 2.9kg. 72% baby's birth weight was between 3 to 3.4 kg and 1% cases baby's birth weight was more than 3.5 kg. A much higher proportion of delivered babies had their weights in the ranges of 3-3.4 kgs followed by 2.5-2.9 kgs. Only 1%

babies had their body weights more than 3.5kgs (Figure 9).

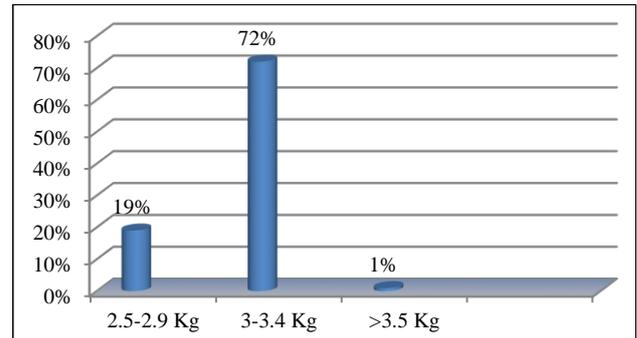


Figure 9: Baby weight distribution.

Neonatal survival

Of the total cases 94% of the babies survived where as 6% of babies were stillbirths. Hence by timely delivery by caesarean section most of the babies delivered were live births however very few deliveries were still birth (Figure 10).

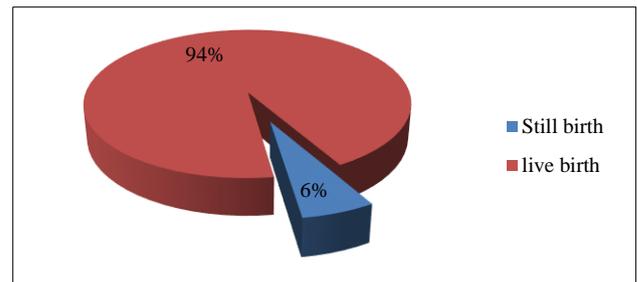


Figure 10: Neonatal survival percentage.

16% of babies born to obstructed labor mother had APGAR at 5 min less than 7 and 84% babies APGAR Score was more than 7 (Figure 11). More than two-third of the cases had APGAR score of more than 7 at 5 min of birth.

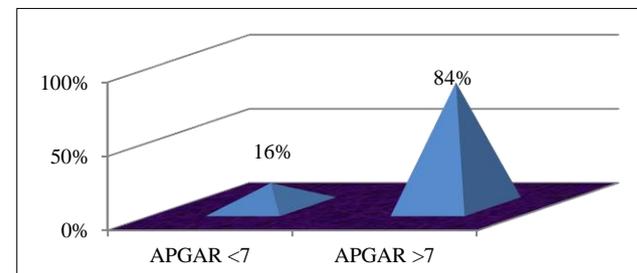


Figure 11: Apgar score at 5 mins of birth.

Of the total babies delivered to mothers with obstructed labour 44% of babies required NICU admission which accounts to slightly less than 50%. More than half (56%) of the delivered babies of obstructed labour did not require any NICU admission (Figure 12).

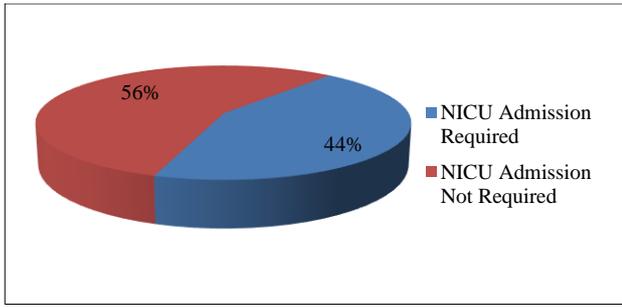


Figure 12: Neonates requiring NICU admission.

We have studied association between maternal age groups and baby outcome due to obstructed labour. It was

seen that most of the alive babies belong to the age group of 24-29 year whereas 30-35 year age group had least number of alive cases. When this was compared against IUDF cases which were less in 18-23 and 24-29 years age groups. But this association was statistically non significant ($p=0.56$) (Table 1).

We studied association between referral of pregnant mother for obstructed labour and baby outcome and it was found that most of the cases which were referred from private hospitals had alive babies (83.3%). This was quite significantly higher than referred cases from PHCs which had IUDF. This relationship was statistically significant. ($p=0.04^*$) Statistical analysis was done using Fischer Exact test (Table 2).

Table 1: Association between maternal age and baby outcome.

Baby outcome				
Age group	Alive (N)	Alive (%)	IUDF (N)	IUDF (%)
8-23 years	6	20%	1	50%
24-29 years	19	63.3%	1	50%
30-35 years	5	16.70%	0	0%
P value	0.56	Fischer's exact test		Not significant

Table 2: Association between referral and baby outcome.

Baby outcome				
Referral	Alive (N)	Alive (%)	IUDF (N)	IUDF (%)
PHC	25	83.3%	2	100%
Private hospital	5	16.7%	0	0%
P value	0.04*	Fischer's exact test		Significant

Table 3: Association between maternal parity and baby outcome.

Baby outcome				
Parity	Alive (N)	Alive (%)	IUDF (N)	IUDF (%)
Multigravida	17	56.7%	1	50%
Primigravida	13	43.3%	1	50%
P Value	0.034*	Fisher's exact test		*Significant

We also studied association between maternal parity and baby outcome in obstructed labor cases. In multigravida category more than 50% cases i.e. 17 cases had delivered live fetus whereas in primigravida category 13 had delivered live fetus. When this compared from IUDFs, only 1 case was found in both multigravida and primigravida categories. This association was also statistically significant. ($p=0.034^*$) Statistical analysis was done using Fischer exact test (Table 3).

DISCUSSION

Henok A et al, has done a study reporting from south west Euthopia in 2015.⁶ Prevalence of obstructed labour in their study was 7.95%. They also reported cephalo pelvic disproportion as the leading cause of obstruction

(66.67%), malpresentation and malposition (25%) and cervical and congenital anomalies (8.33%). The study also emphasized on good antenatal care as most of their cases were unbooked and good referral system to prevent the occurrence of complications.

Another study done by Ileogben Sunday Adeyoe who have reported a multi centric study done at south east Nigeria.⁷ The study reported most of the women were in age group 20-34 years. 33% were Primi and 62.7% were referred from private Hospital. In our study the majority of referrals were from primary health centers (84%) and only 16% were from local hospitals.

Another study reported from Karnataka by Indra et al, also reported percentage of Primi gravida was highest.⁸

They also had more referrals from peripheral areas. This points towards need for capacity building at PHC level for early identification and timely referral of the prolonged labour to prevent obstruction and its sequels.

Ranjana et al, reported from Bihar, incidence of obstructed labour as 8.9%.⁹ In their study malposition (45.61%) and cephalopelvic disproportion (43.85%). Cesarean section was the commonest mode of delivery. 21.92% case rupture uterus was diagnosed before the surgery and in 2.63% cases had scar rupture. In their study PPH occurred in 17.4% cases. Maternal mortality was 3.5% and perinatal mortality was 39%. In our study there was no maternal mortality and still birth was 6%.

Khatun J, in the study reported Primi gravida had highest incidence.¹⁰ Majority (78% cases) had CPD as the cause. Cesarean section was done in 95% of the cases.

Sheikh SR, in the study reported 3.61% of obstructed labor in the study. 90.9% case delivered by cesarean section.¹¹ No mortality occurred in their study.

Joseph N has done a study in 2018 on 272 obstructed labour women.¹² Vaginal swab was taken to determine vaginal colonization with GBS, E. Coli and Enterococcus and associated morbidity was studied by them. They reported 64% obstructed labour women were colonized with the 49% with E.Coli, 5% with GBS and 8% with Enterococcus. The study reported no difference in the maternal and fetal morbidity between non colonized and colonized cases. The important finding was that the number of hours in labour was reported as significant risk factor for vaginal colonization (OD 1.02, 95% CI 1.00-1.03, P=0.04).

Alkire BC et al, have done a study in 2016 where they first did the base line survey audit of 260 deliveries.¹³ Re Audit was done after implementation of intervention in 250 deliveries. They reported in their study implementing the new criteria improved the diagnosis from 74% to 81% (p = 0.049) and also the management of obstructed labour from 4.2% at baseline audit increased to 9.2% after re-audit (p=0.025). The improvement in detection of prolonged labour by enhanced observation of uterine contractions with cervical dilatation and degree of descent of presenting part, arrested cervical dilation, and severe moulding contributed to improved the diagnosis (all p <0.04). Patient reviews by senior obstetricians increased from 34% to 43% (p = 0.045) and reduced time for caesarean section intervention from the median time of 120 to 90 minutes (p = 0.001) improved management (all p <0.05). Perinatal outcomes, neonatal distress and fresh stillbirths, were reduced from 16% to 8.8% (p = 0.01).

Mondal S, et al in reported a study done at tertiary care hospital in West Bengal on 313 patients.¹⁴ Majority of the patients (87.86%) were from low socioeconomic group, 88.82% were from rural areas 16.16% were illiterate, and

27.79% were unbooked. In their study also as in our study commonest cause of obstructed labor was cephalopelvic disproportion (55.59%). Other causes they reported were malposition (23%), malpresentation (18.21%), fetal congenital abnormality (1.28%), myoma (0.32%), and non-dilatation of cervix (1.60%). They also had commonest mode of delivery as cesarean section (85.94%). In their study also majority of the cases (88.82%) were from rural background, 16.61% patients were illiterate, 87.86% patients were of low socioeconomic status, and 27.79% cases were unbooked.

Gleason RL, et al from ethopia interesting study where they have suggested 3D camera based novel safe, scalable approach to better predict risk of CPD.¹⁵ They calculated the CPD risk scores based on anthropometry, clinical pelvimetry, MRI, and Kinect measurements which were compared. Significant differences were observed in most anthropometry, clinical pelvimetry, MRI and Kinect measurements between women delivering via CPD-related C/S versus those delivering vaginally. Results in their study area under the receiver-operator curve from novel CPD risk scores base on MRI-, Kinect-, and anthropometric-features outperformed novel CPD risk scores based on clinical pelvimetry and previously published indices for CPD risk calculated from these data; e.g., pelvic inlet area, height, and fetal-pelvic index.

Wilson reported there was no difference in key outcomes of maternal and perinatal mortality with symphysiotomy when compared with caesarean section.¹⁶ However they reported there was a reduction in infection (rr 0.30, 95% ci 0.14-0.62) but an increase in fistulae (rr 4.19, 95% ci 1.07-16.39) and stress incontinence with symphysiotomy (rr 10.04, 95% ci 3.23-31.21).

CONCLUSION

Obstructed labor is one of the major cause of maternal and perinatal morbidity. 32% had developed fever during post operative period 12.5% cases had wound sepsis and 6% of cases required re-suturing of wound during post operative period. 28% of cases had longer stay which was more than 7 days at hospital. Though there was no maternal mortality but had led to fetal morbidity. 44% of fetus required NICU admission. In 16% fetus APGAR Score at 5 min was <7 and 6% fetus was IUFD.

Cephalopelvic disproportion was the most common cause for obstructed labor. Timely identification of prolonged labor and timely referral and management can save the life of both baby and mother. Referral to tertiary care centre with Blood Bank and NICU facilities is fore needed.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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