

Original Research Article

Preterm caesarean delivery: A clinical study in a tertiary care hospital

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Abstract

Background: Preterm birth continues to be an important problem in modern obstetrics and is related to increased risk for neonatal morbidity and mortality. The value of Caesarean section in preterm labour is less clear. Despite the uncertainty regarding benefits of caesarean section for preterm neonates, caesarean section delivery rates have increased.

Objectives: To analyze indications for caesarean section for preterm delivery and perinatal mortality.

Materials and methods: This prospective study was done over a period of 6 months at Department of Obstetrics and Gynecology, King George Hospital, Visakhapatnam. Data was collected from labour ward, newborn special care unit and was analyzed.

Results: A total of 1308 caesarean sections were performed, of these 218 (16%) were preterm caesarean sections. Of these patients only 40 (18%) were booked cases and remaining 178 (82%) were unbooked. Of these only 7 cases were elective caesarean sections. The most common indications for preterm caesarean section were hypertensive disorders of pregnancy (22.4%), previous caesarean section with threatened scar rupture (15.5%), PROM (12.8%), etc. Of 235 babies born 24 (10.2%) died in the neonatal period. The neonatal death rate for babies weighing less than 1 kg was 71.4% (5 of 7) and 33.3% (6 of 18) for babies weighing 1-1.5 kg, but only 7.1% (15 of 210) for babies heavier than this.

Conclusion: Proper antenatal care, Timely hospital admission; better intrapartum care and vaginal delivery of very low birth weight babies are suggested to reduce the incidence of preterm caesarean section and its attendant complications.

Key words

Preterm caesarean section, Perinatal mortality, PROM, Hypertensive disorders of pregnancy, low birth weight.

Introduction

Preterm birth continues to be an important problem in modern obstetrics and is a large public health concern. Preterm birth is the leading cause of Neonatal deaths and leading cause of death in children under 5 years of age [1, 2].

Each year, 15 million babies in the world, more than one in 10 births, are born too early [3]. Preterm births account for 11.1 percent of the world's live births, sixty percent of them in South Asia and sub-Saharan Africa. 3.5 million babies are born prematurely in India annually accounting for two thirds of births in Asian region [3].

WHO defines the birth prior to 37 completed weeks as preterm birth. For prognostication it has been further divided into extremely preterm (<28 weeks), very preterm (28-<32 weeks), moderate preterm (32-<34 weeks) and late preterm (34-<37 weeks) [8]. Gestational age at birth correlates directly with the neonatal outcome.

There has been much recent debate about the rise in the caesarean section rate. The indications for caesarean section have continued to vary in response to the obstetric problems of a specific community and the capacity of that community's neonatology unit to ensure the survival of the baby after delivery [2].

Recent advances in the neonatal care and long-term survival of preterm and growth retarded babies has led to an increase in the number of preterm caesarean sections, whether 'elective' in the maternal or fetal interest, or to avoid the stress of vaginal birth for a compromised fetus [6].

The abdominal route does not, however, guarantee an easy delivery. If the lower segment is unformed, a vertical incision in the uterus may be necessary [6] and it poses a greater risk of bleeding and infection than emergency term caesarean delivery. Subsequent pregnancies will

be affected, with the risks of scar dehiscence, repeat operations, placenta previa and placental abruption.

Premature infants are at greater risk for short- and long term complications, such as neonatal deaths, intraventricular hemorrhage, necrotizing enterocolitis, respiratory distress syndrome, clinical sepsis and also disabilities and impediments in growth and mental development.

Objective

- To analyze indications for caesarean section for preterm delivery and to evaluate neonatal mortality.

Materials and methods

Study design: A prospective study with clinical follow-up.

Setting: At King George Hospital, Andhra medical college, Visakhapatnam, which is a tertiary referral Centre, catering to majority of the high risk cases in the area.

Study period: 1st January 2019 to 30th June 2019 (6 months).

Inclusion criteria:

- Patients who underwent caesarean sections at less than 37 completed weeks of gestation either by last menstrual date or first trimester scan in case the dates were not known were included in the study.

Exclusion criteria:

- Preterm Caesarean section with rent repair and peripartum caesarean hysterectomy done in cases of ruptured uterus were excluded from this study

Methodology

A prospective study was undertaken at Department of Obstetrics and Gynecology, KGH from 1st January 2019 to 30th June 2019, which included all antenatal women who underwent preterm caesarean section at <37 weeks of gestational age. Detailed history from Patients regarding maternal age, parity, booking status, previous obstetric history were taken, indications

for caesarean section was noted. Where more than one indication was recorded for the operation, the most important in the authors' opinion was chosen for the study. Any perinatal deaths in the study population were also noted

Results

During the study period, there were 3116 deliveries, of which 463(14.8%) were preterm

births. Out of 463 preterm births, 245(52.9%) delivered vaginally and 218(47.1%) delivered by cesarean section. 1308 patients were delivered by caesarean section during the study period, with a caesarean section rate of 41%, of these 16% (218) were preterm caesarean section and 7% was incidence of preterm caesarean section rate of total deliveries during the study period (**Figure – 1**).

Figure – 1: Total deliveries.

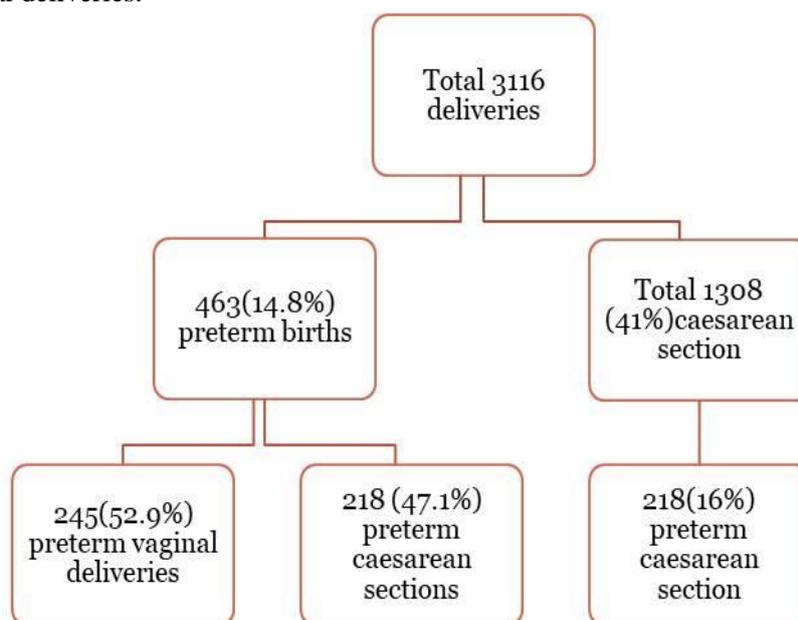


Figure - 2: Booking status.

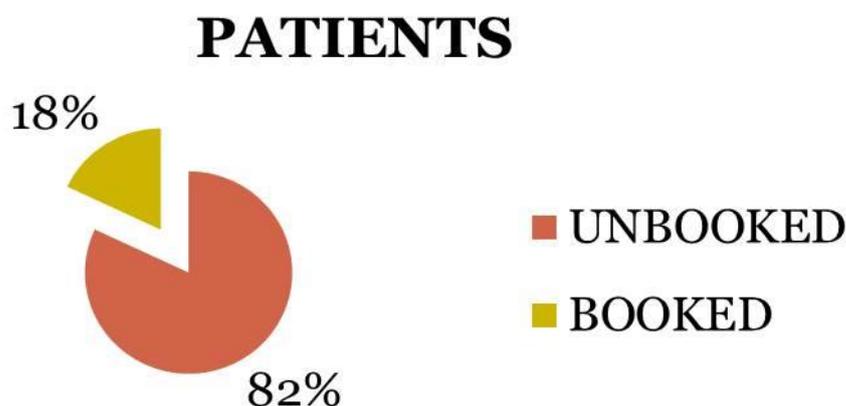


Table - 1: Booking status.

Booking status (n=218)	No. of pregnant women	Percentage%
Booked	40	18%
Unbooked	178	82%

Most of the patients 178 (82%) were unbooked, and 40 (18%) were booked as per **Figure – 2, Table - 1**.

Figure - 3: Age of patients.

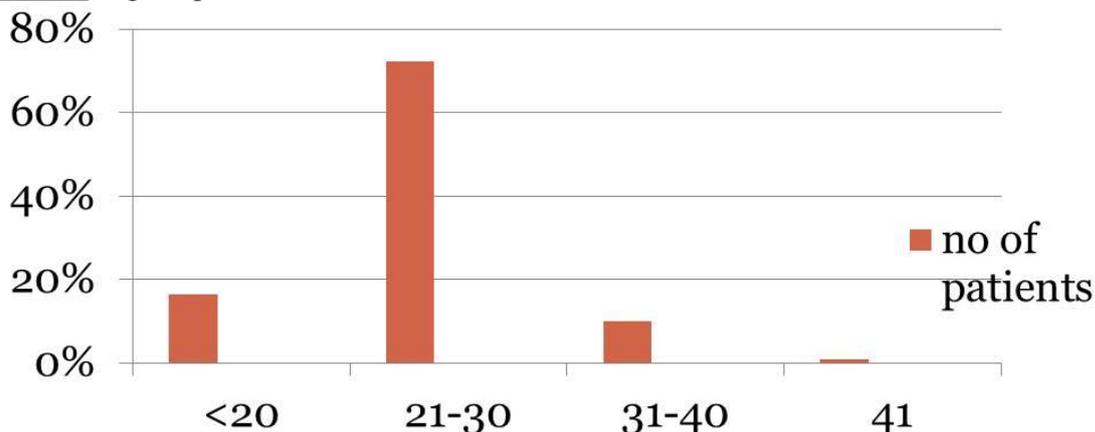


Table - 2: Age of the patients.

Age in years	Number of patients (N=218)	%
<20	36	16.5%
21-30	158	72.4%
31-40	22	10.09%
≥41	2	0.9%

In present study, preterm caesarean sections in <20 years of age was 16.5% (36), in the age group 21-30 years was 72.4% (158), in the age group 31-40 years was 10.09% (22), in the age group ≥41 was 0.9% (2). The highest number of preterm caesarean sections was observed in the age range of 21 to 30 years (**Figure – 3, Table – 2**).

Figure - 4: Gravida.

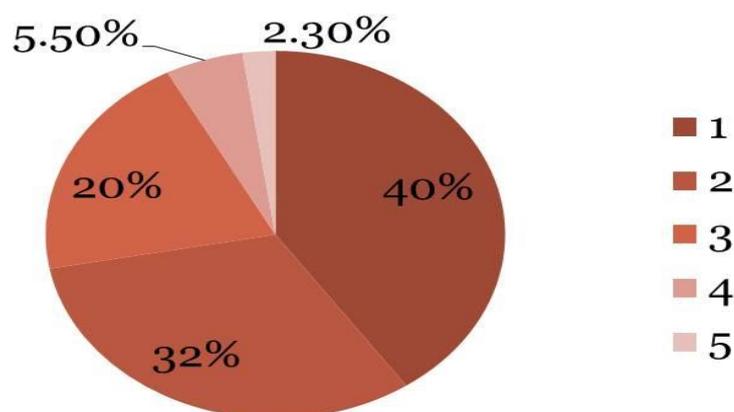


Table – 3: Gravida of the patient.

Gravida	Number of patients (N=218)	%
1	88	40.4%
2	69	31.7%
3	44	20.2%
4	12	5.5%
≥5	5	2.3%

In present study, 40.4% were primigravida, 31.7% were second gravida, 20.2% were third gravida, 5.5% were fourth gravida and 2.3% were ≥ fifth gravida (**Table – 3, Figure – 4**).

Figure - 5: Gestational age.

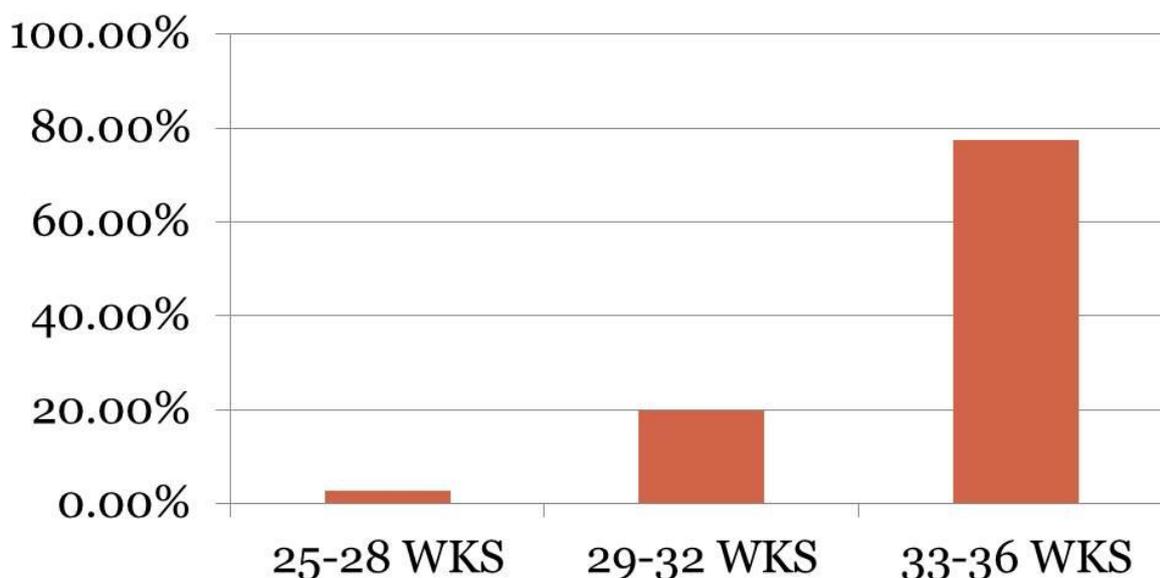


Table - 4: Gestational age of patient.

Gestational age in weeks	Number of patients (N=218)	%
25-28	6	2.8%
29-32	43	19.7%
33-36	169	77.5%

According to gestational age, 2.8% of preterm caesarean sections occurred at less than 28 weeks', about 19.7% at 29–32 weeks', about 77.5% at 33–36 weeks (Table – 4, Figure – 5).

Majority of caesarean sections done in the present study were late preterm births at the gestational age range of 33 to 36 weeks (77.5%).

Table - 5: Birth weight of babies.

Birth weight in grams	Number of babies (N=235)	%
<1000	7	3%
1000-1499	18	7.7%
1500-1999	52	22.1%
2000-2499	84	32.7%
≥2500	74	31.5%

In present study, 3% of babies weighed <1 kg, 7.7% of babies weighed between 1 -1.4 kg, 22.1% of babies weighed between 1.5-1.9 kg, 35.7% of babies weighed 2-2.4 kg, 31.5% weighed more than 2.5 kg. Most of the babies were low birth weight (<2.5 kg) – 161 (68.5%) as per Table – 5.

Table - 6: Mode of delivery.

Mode of delivery	Preterm caesarean section	%
Spontaneous	132	60.6%
Indicated induction	49	22.5%
Caesarean	37	16.9%

60.6% (132) patients had preterm spontaneous onset of labour. In 22.5% (49) patients induction of labour was done. In 16.9% (37) patients prelabour caesarean delivery was performed (Table – 6).

Table - 7: Preterm caesarean section.

Preterm caesarean section (n=218)	No. of patients	%
Primary elective caesarean section	4	1.83%
Primary emergency caesarean section	139	63.7%
Repeat elective caesarean section	3	1.4%
Repeat emergency caesarean section	72	33%

Table - 8: Indications for elective preterm caesarean section.

Indication elective before labour (N=7)	No. of patients	%
Overt diabetes with bad obstetric history	3	42.8%
Hydrops with previous history of uterus perforation and past history of Asherman syndrome	1	14.3%
Twins with precious pregnancy	2	28.6%
Breech with oligohydramnios	1	14.3%

Table - 9: Indication for emergency caesarean section.

Indication	Number of patients	Percentage
Hypertensive disorders of pregnancy	49	22.4%
preeclampsia	33	15.1%
eclampsia	16	7.3%
Previous caesarean section with threatened scar rupture	34	15.5%
Prom	28	12.8%
Antepartum hemorrhage	22	10.09%
placenta praevia	17	7.7%
abruption	5	2.2%
Fetal distress	17	7.7%
Breech	16	7.3%
Twins	11	5.04%
Oligohydramnios	10	4.5%
IUGR	4	1.8%
Meconium stained liquor	4	1.8%
Non progression of labour	3	1.3%
Malpresentation	3	1.3%
Cord prolapse	2	0.9%
Contracted pelvis	2	0.9%
GDM with bad obstetric history	2	0.9%
GDM with big baby	2	0.9%
Multiple cord loops around neck	1	0.4%
Anammolous baby with obstructed labour	1	0.4%
Rh isoimmunization with fetal anemia(ICT positive)	1	0.4%

Out of 218 preterm caesarean sections, 3.2% (7) were elective caesarean section and 96.8% (211) were emergency caesarean section. Of 7 elective caesarean deliveries, 57.1% (4) were primary elective caesarean section and 42.9% (3) were repeat elective caesarean section. Of 211 emergency caesarean sections, 65.9% (139) were primary caesarean section and 34.1% (72) were repeat caesarean section. In this study primary emergency caesarean section were highest number observed with 63.7% (**Table – 7**).

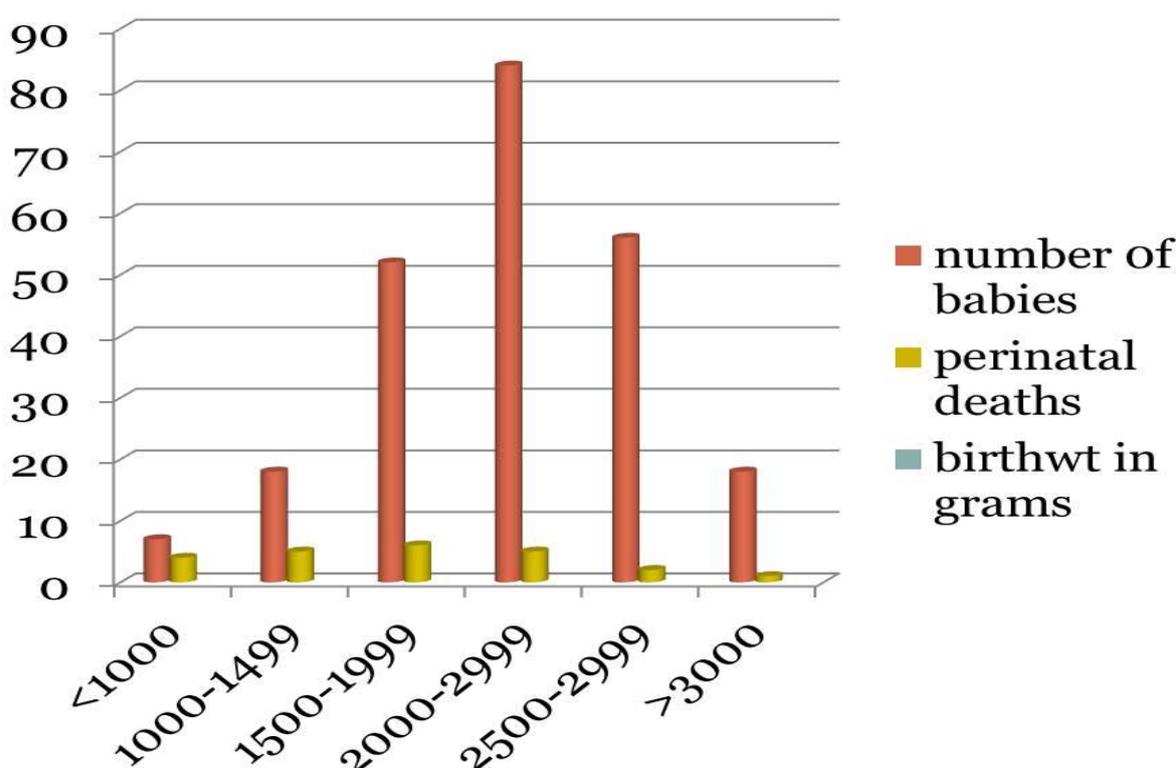
In seven patients, elective caesarean section was done, 42.8% (3) cases were terminated due to overt diabetes with bad obstetric history (**Table – 8**).

The three main indications for preterm emergency caesarean section were Hypertensive disorders of pregnancy (22.4%), Previous caesarean section with threatened scar rupture (15.5%) and Premature rupture of membranes (12.8%) as per **Table – 9**.

Table - 10: Perinatal deaths.

Birth weight in Grams	Perinatal deaths	Percentage (%)
<1000	5	71.4%
1000-1499	6	33.3%
1500-1999	7	13.5%
2000-2499	5	5.9%
≥2500	3	4%

Figure - 6: Perinatal deaths.



There were 24 Neonatal deaths, with a neonatal mortality rate of 102 per 1000 live births. Perinatal deaths decreased with increasing birth weight. The neonatal death rate for babies weighing less than 1 kg is 71.4%(5 of 7)and 33.3% (6of 18) for babies weighing 1-1.4 kg, but only 7.1% (15 of 210)for babies more than 1.5 kg (**Table – 10, Figure - 6**).

Discussion

The high incidence of preterm caesarean section in the advanced countries of the world has been attributed to recent advances in neonatal care and

long-term survival of preterm and growth-retarded babies [2] where as in developing countries like India with higher incidence of preterm births, incidence of preterm caesarean sections is raising due to improved survival rates in the moderate and late preterm delivery category. Although caesarean section is now a fairly 'safe' procedure, it does carry all the risks of major surgery, whereas preterm caesarean section improves the neonatal survival rates but the maternal morbidity and mortality rates were increased.

WHO has reported an incidence of around 9-12% for preterm birth, which leads to an estimated birth of 15 million of such babies. India has an incidence of around 11% and shares two thirds of the global burden of preterm births. Incidence of preterm births in the present study is 14.8 %, which is slightly higher than the incidence of preterm births in our country as the study was conducted in a tertiary care hospital, which caters to high risk cases referred from remote areas whereas incidence was 18.4% in Jamal S, et al. study [4] and 11.5 % in Carmoleal, et al. [5].

The maternal characteristics of age and parity do not appear to have any significant relationship to the incidence of preterm caesarean section, because the highest number of preterm babies in present study were delivered within the age range of 21 to 30 years (72.7%), which is the period of maximum reproductive performance of these women and maximum number of women being primipara in present study (46%), and also in pinion et al study (56%).

In the present study, most of cases were unbooked (82%), where as in Ozumba BC, et al. [2] study 80% were booked cases.

In the present study, majority of the preterm caesarean sections done for late preterm births - 33- 36 wks gestation (77.5%), Ozumba BC, et al. [2] reported - 68%, Jamal S, et al. [4] reported - 53%.

Out of 218 preterm births in the present study, 161 babies born were low birth weight (68.5%). Ozumba BC, et al. [2] reported 68%, Jamal S, et al. [4] reported 53%. Perinatal mortality rates for preterm caesarean section were 10.2% (24 perinatal deaths out of 235 live births). Majority of perinatal deaths occurred at 24-32 weeks gestation , due to extreme prematurity with birth weights less than <1.5 kg (45.83%). Perinatal death rate in Pinion SB, et al. [6] study was 31%, Jamal S, et al. [4] was 17.4 % and Wazed F, et al. [9] reported 32%.

During the study period there were a total of 3316 deliveries, of which 1308 patients were

delivered by caesarean section, with a caesarean section rate of 41%, 218 caesarean sections were done at <37 weeks gestation age which constitutes to 16%, where as in 12% in Pinion SB, et al. [6], 8% Ozumba BC, et al. [2], 33% in Jamal S, et al. [4] study. In the present study, majority of preterm caesarean sections were emergency caesarean sections (96.7%), with only 3.3% were elective surgeries, in Wazed F, et al. [9] 2% were elective caesarean sections, whereas in Pinion, SB, et al. [6] 41% were elective caesarean sections.

The leading indications for preterm caesarean sections were preeclampsia (22.4%), premature rupture of membranes (12.8%) and previous caesarean section with threatened scar rupture (15.5%). A notable indication for preterm caesarean section was previous caesarean section. This is a self-propagating cause, and the reduction of its contribution to the incidence of preterm caesarean section is likely to be arduous². Where as in Ozumba BC, et al. [2] study the indications were Hypertensive disorders of pregnancy (31%), placenta previa (28%), in Wazed F, et al. [9] study preterm caesarean section was done in 44% patients for hypertensive disorders of pregnancy, 9% for post caesarean pregnancy and 8% for prom. Antepartum hemorrhage being one the common indications for caesarean section including both placenta previa and abruptio placenta in the present study (10.1%), compared to 28% in Ozumba BC, et al. [2] study.

Fetal distress also figured prominently as an indication for caesarean section (7.7%) however, incidence of fetal distress is more in preterm deliveries. Use of more sensitive equipment such as the cardiotocographs and fetal scalp blood sampling can reduce the preterm caesarean section rates for fetal distress. It is wise to consider abnormal fetal heart rate patterns with grade II to grade III meconium-stained liquor as enough indication for immediate delivery, possibly by caesarean section [2] for better neonatal survival rates especially in premature babies. The delivery of moderate to extreme

premature babies by preterm caesarean section could be better managed by adequate treatment of antecedent pathology [4]. This involves timely hospital admission of cases such as preeclampsia, multiple pregnancy, placenta praevia and intrauterine growth retardation, where expectant management plays an important role in furthering the gestational age. However, in many cases this may be difficult because limited bed space and medical facilities are major constraints in our hospital practice [4]. A better salvage rate of the delivered infants will be obtained by improving facilities and care currently being offered in neonatology unit.

Conclusion

The optimal mode of delivery for women thought to be in preterm labor is controversial [1].

Specialized antenatal care for the patients, who are thought to be at risk of preterm birth, can bring down the incidence of preterm birth [4]. Above all, early booking, early detection of risk factors and prompt interventions and promotion for institutional deliveries with NICU set up especially in preterm labors should be promoted. Timely hospital admission of cases such as preeclampsia, multiple pregnancy, placenta praevia and intrauterine growth retardation [2], where expectant management plays an important role in furthering the gestational age and also judicious use of tocolytics in acute preterm labor for completion of steroid course can improve the neonatal survival rates.

Following the directions from WHO, antenatal steroids, KMC, magnesium sulphate for neuroprotection should be strongly recommended [4]. Adolescent health education, counseling for contraception, to reduce unintended pregnancies and birth spacing can yield miraculous results in this direction [4].

Though Caesarean section rates are increasing for preterm births, there is conflicting evidence regarding its benefits in increasing the survival rate for early and very low birth weight preterm

births. Moreover, it does not prevent neurodisability and cannot be recommended in light of recent evidence unless there are other obstetric indications to justify it [7].

Resorting to preterm caesarean section may not always reduce the neonatal mortality and morbidity. Hence careful approach is needed in selecting cases for preterm caesarean section.

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References

1. Alfircvic Z, Milan SJ, Livio S. Caesarean section versus vaginal delivery for preterm birth in singletons. *Cochrane Database of Systematic Reviews*, 2012; 6(6): CD000078.
2. Ozumba BC, Mbadiwe IJ. Preterm caesarean section in Nigerian obstetric practice. *Journal of the National Medical Association*, 1993 Nov; 85(11): 857.
3. Howson CP, Kinney MV, McDougall L, Lawn JE. Born too soon: preterm birth matters. *Reproductive health*, 2013 Nov 1; 10(S1): S1.
4. Jamal S, Srivastava R. A retrospective analytical study of the epidemiology and causes of preterm birth. *Int J Reprod Contracept Obstet Gynecol.*, 2017; 6(12): 5453-7.
5. do Carmo Leal M, Esteves-Pereira AP, Nakamura-Pereira M, Torres JA, Theme-Filha M, Domingues RM, Dias MA, Moreira ME, Gama SG. Prevalence and risk factors related to preterm birth in Brazil. *Reproductive health*, 2016 Oct 1; 13(3): 127.
6. Pinion SB, Mowat J. Preterm caesarean section. *BJOG: An International Journal of Obstetrics & Gynaecology*, 1988 Mar; 95(3): 277-80.

7. Ray Chaudhuri Bhatta S, Keriakos R. Review of the recent literature on the mode of delivery for singleton vertex preterm babies. *Journal of pregnancy*, 2011 Jul 24; 2011.
8. Vogel JP, Chawanpaiboon S, Watananirun K, Lumbiganon P, Petzold M, Moller AB, Thinkhamrop J, Laopaiboon M, Seuc AH, Hogan D, Tunçalp O. Global, regional and national levels and trends of preterm birth rates for 1990 to 2014: protocol for development of World Health Organization estimates. *Reproductive health*, 2016 Dec; 13(1): 1-9.
9. Wazed F, Jahan S, Tanira S. Indication of Caesarean Section Operation in Preterm Pregnancy and Its Outcome A Study of 100 Cases. *Journal of Dhaka Medical College*, 2009; 18(2): 124-6.