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PRECURSOR OF DELIVERY AND NEONATAL OUTCOME IN EARLY TERM DELIVERIES

Gynaecology

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ABSTRACT

Objectives— To determine neonatal morbidity rates for early term birth compared to full term birth by precursor leading to delivery.

Study Design— This was Prospective Study Department of Obstetrics & Gynaecology Zenana Hospital, SMS Medical College, Jaipur from March 2015 to February 2016.. Precursors for delivery were categorized as spontaneous labor, premature rupture of membranes (PROM), indicated, and no recorded indication. After excluding anomalies, rates of neonatal outcome by precursor were compared . SAMPLE SIZE – Sample size was calculated to 296 subjects in each of the two groups at alpha error 0.05 & study power 80% assuming the proportion of the low birth weight among full term & early term pregnancy to be 0.8% & 5% respectively hence for study purpose 300 subjects were taken in each of two groups.

Results— Overall 48% of early term births were indicated, followed by 43.33%% spontaneous in onset, 6.33% with PROM, and 2.34% with no recorded indication. Birth weight were higher and respiratory morbidity were lowest at or beyond 39 weeks compared to the early term period for most precursors.

Conclusion— This study demonstrates that gestational age remains a predictor of neonatal morbidity. Given the higher neonatal morbidity at 37 compared to 39 weeks regardless of delivery precursor, our data support recent recommendations for designating early term to include 37 weeks.

KEYWORDS:

Early term birth; neonatal morbidity; precursors for delivery

Introduction

Term pregnancy has traditionally been defined as one in which 260–294 days have elapsed since the first day of the last menstrual period. Neonates born before this interval (less than 37 completed weeks of pregnancy) are classified as preterm, whereas those delivered beyond this interval (42 weeks and beyond) are designated postterm.[1,2]Term birth has previously been considered a homogeneous group to which risks associated with preterm and postterm births are compared, but there is a growing body of data that suggests that significant differences exist in the outcomes of infants delivered within this 5-week interval.[3]The American College of Obstetricians and Gynecologists (The College) and the Society for Maternal-Fetal Medicine (SMFM) are discouraging use of the general label 'term pregnancy' and replacing it with a series of more specific labels: 'early term,' 'full term,' 'late term,' and 'postterm.'

The following represent the four new definitions of 'term' deliveries: -[4]

- **Early Term :** Between 37 weeks 0 days and 38 weeks 6 days
- **Full Term:** Between 39 weeks 0 days and 40 weeks 6 days
- **Late Term:** Between 41 weeks 0 days and 41 weeks 6 days
- **Postterm:** Between 42 weeks 0 days and beyond

Neonatal Morbidities Associated With Early-Term Delivery[4]

- Respiratory distress syndrome
- Transient tachypnea of the newborn
- Ventilator use
- Pneumonia
- Respiratory failure
- Neonatal intensive care unit admission
- Hypoglycemia
- 5-minute Apgar score less than 7
- Neonatal mortality

Both the reason and gestational age at delivery are likely important factors contributing to morbidity, as neonatal morbidity has been found to vary depending on the underlying indication for delivery between 34 and 36 weeks of gestation. However, there has been a paucity of data regarding whether increased morbidity in early term neonates is a consequence of physiologic immaturity at earlier gestation or due to the underlying precursor leading to early term delivery.Therefore, our objectives were to determine if morbidity differed in neonates born during the early term and full term period by delivery precursor and to describe the precursors leading to early term birth[13] .

Material and Method:

Study design – prospective study

Place of study – department of obstetrics & gynaecolony, zenana hospital, sms medical college, Jaipur ,Rajasthan.

Duration of study – march 2015 to February 2016

Sample size – sample size was calculated to 296 subjects in each of the two groups at alpha error 0.05 & study power 80% assuming the proportion of the low birth weight among full term & early term pregnancy to be 0.8% & 5% respectively {as per seed article} hence for study purpose 300 subjects were taken in each of two groups.

Inclusion criteria

- Regular menstrual cycle and sure of dates
- 37 wks to 40 wks 6 days- grouped into two (early term and full term)
- Spontaneous labour
- Premature rupture of membrane
- Previous two caesarean
- No recorded indication
- Any planned caesarean, eg. Breech, transverse lie
- Reassuring nst

Exclusion criteria

- Difficulty in determining gestational age
- Preterm, late term, post term pregnancy
- Aph
- Multiple pregnancy
- Iugr
- Congenital anomalies
- Medical illness
- Received blood transfusion
- Decreased fetal movements

Methodology

- Prospective study of women admitting in labour room with gestational age between 37 wks to 40 wks and 6 days at zenana hospital, sms medical college, jaipur was conducted.
- Exclusion and inclusion criteria applied.
- Gestational age estimated by lmp or first usg.
- Delivery precursors identified.
- Data of maternal and early neonatal outcomes compared, correlated and statistically analyzed.
- Chi-square test was used to assess statistical significance of association.
- P-value < 0.05 was considered as statistically significant.

Clinical evaluation: the recruited group were subjected to: -
- Detailed history
- Examination
- Investigation – routine anc investigations, usg

Results: 600 subjects were recruited on the basis of inclusion and exclusion criteria. A form was completed for each subjects, a detailed medical and obstetric history taken, clinical examination and routine antenatal investigations and USG done. Delivery precursors identified. Data of maternal and early neonatal outcome compared, correlated and statistically analyzed.Salient features of this study were: -Mean age of study population 24.12 3.61 years. The urban population constituted major part of study population (68.67%). Majority of study population belonged to middle class (71.67%) and maximum cases were Hindu (83%). Majority of cases could read and write (70%).Early term births were more in primi gravida subjects (43.33%).More early-term infants were delivered by cesarean section compared with term infants (49.33%).

In early term birth indicated deliveries were more (48%) and in full term birth spontaneous deliveries were more (51.3%). In early term neonates indicated deliveries were associated with more low birth weight (9%) followed by spontaneous (7%), PROM (3.33%) and not indicated deliveries (0.67%) [Indicated - ^{2} = 0.387, d.f. = 1, p >0.05, NS; Spontaneous - ^{2} = 0.146, d.f. = 1, p >0.05, NS]table(2)

Table – 1

Distribution According to Precursor of Delivery of Case & Control Subjects

Precursor of Delivery	Case		Control	
	No.	%	No.	%
Indicated	144	48.00	126	42.00
Spontaneous	130	43.33	154	51.33
PROM	19	6.33	15	5.00
Not Indicated	7	2.34	5	1.67
Total	300	100.00	300	100.00

Indicated
$x^2 = 2.180$ *d.f. = 1* *p > 0.05* *NS*
Spontaneous
$x^2 = 3.851$ *d.f. = 1* *p < 0.05* *Sig*
PROM
$x^2 = 0.500$ *d.f. = 1* *p > 0.05* *NS*

Table – 2

Distribution of Precursor of Delivery According to Birth Weight of New Born Baby of Case & Control Subjects

Precursor of Delivery	Case			Control		
	LBW	NBW	Total	LBW	NBW	Total
Indicated	27 (9.00%)	117 (39.00%)	144 (48.00%)	23 (7.67%)	103 (34.33%)	126 (42.00%)
Spontaneous	21 (7.00%)	109 (36.33%)	130 (43.33%)	13 (4.33%)	141 (47.00%)	154 (51.00%)
PROM	10 (3.33%)	9 (9.67%)	19 (6.33%)	2 (0.67%)	13 (4.33%)	15 (5.00%)
Not Indicated	2 (0.67%)	5 (1.67%)	7 (2.33%)	0 (0.00%)	5 (1.67%)	5 (1.67%)
Total	60 (20.00%)	240 (80.00%)	300 (100.00 %)	38 (12.67 %)	262 (87.33%)	300 (100.00 %)

Indicated
$x^2 = 0.387$ *d.f. = 1* *p > 0.05* *NS*
Spontaneous
$x^2 = 0.146$ *d.f. = 1* *p > 0.05* *NS*

low birth weight was associated more with indicated deliveries in both early term birth (9%) and in full term (7.67%) in comparison to other precursor of deliveries

Spontaneous deliveries and indicated deliveries in early term birth were associated with more respiratory distress (2.67% and 1.67% respectively) followed by PROM (1.33%) and not significant [Indicated -x^2 = 0.725, d.f. = 1, p >0.05, NS; Spontaneous - x^2 = 0.301, d.f. = 1, p >0.05, NS; PROM - x^2 = 2.073, d.f. = 1, p >0.05, NS](table4).

Table:3

Distribution of Precursor of Delivery According to Respiratory Distress of New Born Baby of Case & control Subjects

Precursor of Delivery	Case			Control		
	Respiratory Distress			Respiratory Distress		
	Present	Absent	Total	Present	Absent	Total
Indicated	5 (1.67%)	139 (46.33%)	144 (48.00%)	8 (2.67%)	118 (39.33%)	126 (42.00%)
Spontaneous	8 (2.67%)	122 (40.67%)	130 (43.33%)	6 (2.00%)	148 (49.34%)	154 (51.34%)
PROM	4 (1.33%)	14 (4.67%)	19 (6.33%)	1 (0.33%)	14 (4.66%)	15 (5.00%)
Not Indicated	0 (0.00%)	7 (2.33%)	7 (2.33%)	0 (0.00%)	5 (1.67%)	5 (1.67%)
Total	18 (6.00%)	282 (94.00%)	300 (100.00%)	15 (5.00%)	285 (95.00%)	300 (100.00 %)

Indicated
$x^2 = 0.725$ *d.f. = 1* *p > 0.05* *NS*
Spontaneous
$x^2 = 0.301$ *d.f. = 1* *p > 0.05* *NS*
PROM
$x^2 = 2.073$ *d.f. = 1* *p > 0.05* *NS*

There was no significant difference noted in early term neonatal mortality rates according to precursor of delivery [Indicated - x^2 = 0.000, d.f. = 1, p >0.05, NS; Spontaneous - x^2 = 0.000, d.f. = 1, p >0.05, NS](table-5).

Table – 4

Distribution of Precursor of Delivery According to Neonatal Mortality of New Born Baby of Case & Control Subjects

Precursor of Delivery	Case			Control		
	Neonatal Mortality			Neonatal Mortality		
	Present	Absent	Total	Present	Absent	Total
Indicated	1 (0.33%)	143 (47.67%)	144 (48.00%)	2 (0.67%)	124 (41.33%)	126 (42.00%)
Spontaneous	2 (0.67%)	128 (42.67%)	130 (43.33%)	1 (0.33%)	153 (51.01%)	154 (51.34%)
PROM	1 (0.33%)	18 (6.33%)	19 (6.33%)	0 (0.00%)	15 (5.00%)	15 (5.00%)
Not Indicated	0 (0.00%)	7 (2.33%)	7 (2.33%)	0 (0.00%)	5 (1.66%)	5 (1.66%)
Total	4 (1.33%)	296 (98.67%)	300 (100.00 %)	3 (1.00%)	297 (99.00%)	300 (100.00 %)

Indicated
$x^2 = 0.000$ *d.f. = 1* *p > 0.05* *NS*
Spontaneous
$x^2 = 0.000$ *d.f. = 1* *p > 0.05* *NS*

Discussion:

In our study more early-term infants were delivered by cesarean section compared with term infants (49.33%)(table-1).

Sengupta S et al (2013)[8] reported more early-term infants were delivered by cesarean section compared with term infants, which is a contributor to longer duration of hospital stay and more respiratory morbidity in this population. Ramprakash MA et al (2016)[10] also reported 52.2% LSCS in early term birth.

Maximum number of deliveries occurred in cases (48%) due to

indication and in controls due to spontaneous onset (51.3%). With increasing gestational age percentage of indicated deliveries, PROM, non indicated delivery decreases and percentage of spontaneous deliveries increases. Parikh LI et al (2014)[9] also reported 53.6% term deliveries occurred with spontaneous onset.Parikh LI et al (2014)[9]reported that women who underwent an indicated delivery during the early term period were more likely to have a neonate weighing <2,500 or >4,000 grams compared to deliveries among the other three precursors for early term birth (p <.001).

Regarding precursor of deliveries and respiratory distress between two groups. There is no significant difference present between two groups. Respiratory distress is more in spontaneous and prom deliveries in case group in comparison to control group.Parikh LI et al (2014)[9] reported that serious neonatal respiratory morbidity was also higher with delivery at 37 compared to 39 weeks for spontaneous labor, indicated, and no recorded indication deliveries. There were no significant differences in neonatal respiratory morbidity for deliveries at 38 compared to 39 weeks of gestation with the exception of deliveries with no recorded indication.

No significant difference between two groups according to precursor of deliveries and neonatal mortality.Parikh LI et al (2014)[9] reported that stillbirth (antepartum fetal deaths >23 weeks of gestation) and perinatal mortality (stillbirths and neonatal deaths prior to discharge) rates were calculated per number of ongoing pregnancies reaching a given gestational week. The stillbirth and perinatal mortality rates were as follows: 37 weeks: 0.035% and 0.05%; 38 weeks: 0.034% and 0.06%; 39 weeks: 0.035% and 0.06%; 40 weeks: 0.07% and 0.12%; and 41 weeks: 0.11% and 0.17%, respectively, although rates were not significantly different across weeks (p=.942 for stillbirth and p=.927 for perinatal mortality).

CONCLUSION

Our study suggest that neonatal morbidities are more in early term deliveries. Further studies are needed in this regard in order to establish a perfect correlation between precursor of delivery and neonatal morbidities. This will help us to set standard guidelines to determine optimal time for delivery and to reduce economic cost of neonatal intensive care and ongoing health care and educational needs in our country.

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