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A STUDY OF PREVALENCE OF MORBIDITY AND MORTALITY PATTERNS OF LATE PRETERM NEONATES IN A TERTIARY CARE HOSPITAL.

Neonatology

Dr. Sonal Gupta MD, Senior Resident DNB, Dept. Of Pediatrics, MGUMST Jaipur.
Dr Madhu Mathur MD, Professor & Unit Head
Dr Priya Marwah* DNB, Associate Professor *Corresponding Author
Dr. Shalu Chahar Junior Resident I year

ABSTRACT

BACKGROUND: Prematurity is the leading cause of death in under five mortality globally. Among Preterm, late preterm comprise majority of this population and their number is showing a continuous rising trend. Study shows morbidity and mortality pattern of late preterm as compared to term neonates at a tertiary care centre in Jaipur.

***METHODS*:** The present study was conducted in the department of Pediatric Medicine, Mahatma Gandhi Medical College and Hospital on neonates born between April 2015 and April 2016, fulfilling the inclusion criteria in this prospective study. The babies were evaluated for cry, activity, feeding, colour, passage of stools, obvious external congenital malformations and for morbidities and mortality

RESULT: Of 200 babies in the study, majority population in late preterm group was of 36 weeks (60%) and in term was in 37 weeks gestation (32%). Mean birth weight was higher in term group (2.789Kg) than late preterm (2.357Kg). Late preterm were 2.5 times at higher risk of being LBW as compared to term. Mean APGAR score was higher in terms at both 1 and 5 minutes. Late preterm were at twice the risk to suffer at least one morbidity (42%) Major morbidity in our study was respiratory (25%) like TTNB, HMD and MAS followed by feeding problems (24%) and then hypothermia (14%) in late preterm. Mortality was 3 times higher in late preterm as compared to term neonates.

CONCLUSION: In this study, we conclude that late preterm neonates are significantly at higher risk of developing morbidity and mortality as compared to term neonates.

KEYWORDS

Late preterm, morbidity, mortality

INTRODUCTION

Prematurity is the leading cause of death in under five mortality globally. Around 15 million of preterm births occur every year globally suggesting more than 1 in every 10 neonates born is preterm (1). In preterm births, late preterm comprise majority of this population and their number is showing a continuous rising trend (2, 3). The American Academy of Pediatrics (AAP), American College of Obstetrics and Gynecology (ACOG) and National Centre for Health Statistics (NCHS) define late preterm birth as the delivery of an infant from 34 weeks to 36 weeks and 6 days of gestation (i.e. 239 to 259 days) counting from the first day of last menstrual period (5), considering that in obstetrics practice 34 weeks is considered as a maturational mile stone, that is, it is thought after 34 weeks lungs usually have surfactant hence antenatal steroids can be avoided (6,7,8,9,10).

This increase in incidence of late preterm neonates is not well understood but thought to be due to rise in caesarean delivery, labour induction and increase in maternal morbidities which could affect outcome(13), increased use of reproductive technologies leading to multiple pregnancies and increased surveillance and medical interventions that detect defects, leading to earlier births (14).

The late preterm infants are at twice to thrice increased risk of morbidities like hypoglycemia, poor feeding, jaundice, infection and re-admission rates after initial hospital discharge (15, 16, 17, 18), and is estimated to be nearly 12%, 26% and 52% in 36,35 and 34 weeks gestation respectively and may be due to physiologic and metabolic immaturity and limited compensatory responses to external environment in late preterm neonates (2). The infant and neonatal mortality rate for late preterm infants is on an average three folds higher than that for term infants (19).

There is very limited data available on the problems regarding late preterm babies in India (20). Keeping these areas of concern in mind, this study was undertaken to study the morbidity and mortality pattern of late preterm infants as compared to term neonates.

MATERIALS AND METHODS

The present study was conducted in the Department of Pediatric Medicine, Mahatma Gandhi Medical College and Hospital, Jaipur, India. This was a hospital based observational, descriptive comparative analysis. Preterm neonates born between 34 0/7 and 36 6/7 weeks of gestation were compared with equal number of term neonates 37 0/7 to 41 6/7 weeks gestation born in Mahatma Gandhi Hospital, a tertiary care referral hospital. The study was approved by the Institutional Ethics Committee.

Sample size Analysis

The sample size calculated was minimum 67 cases of late preterm and terms in each group at 95% confidence interval and 80% power to verify the expected proportion of morbidities that was 22% in group late preterm as compared to 3% in group term as per the seed article. So for the study, after rounding off 100 late preterm and 100 terms were recruited in the study from April 2015 to April 2016. First late preterm was chosen by chit in the box method and then every eligible late preterm was observed and the successive eligible term of that preterm was included in the study.

Inclusion Criteria

Cases: Late preterm babies that is neonates between 34 weeks to 36 weeks and 6 days either vaginally or by caesarean section.
Controls: Term babies, neonates born between 37 weeks to 41 weeks and 6 days either vaginally or by caesarean section.

Exclusion criteria

Neonates with congenital abnormalities, multiple gestations

Baby details

Babies were either shifted to NICU or to mother's side based on the baby's condition and was followed up till discharge. The following parameters were noted, 1) Gestation, 2) Sex, 3) Birth weight, 4) Resuscitation at birth and APGAR scoring at 1 and 5 minutes. The babies were evaluated for cry, activity, feeding, colour (cyanosis and jaundice), passage of stools, obvious external congenital malformations and for danger signs. The data was recorded on Performa and analysed using descriptive statistics.

Survival was defined as the discharge of a live infant from the hospital.

STATISTICAL ANALYSIS

Statistical analysis was performed with the SPSS, Trial version 23 for Window. Statistical software package (SPSS inc, Chicago, il, USA and Primer. The Categorical data were presented as numbers (percent) and were compared among groups using Chi square test. Groups were comparative for quantitative data, were presented as mean and

standard deviation and were compared using student t-test (2 groups) and ANOVA Test (>2 groups) and post HOC Test Turkey. Test applying to find out the most significant groups among all the groups. Probability P value <0.05 was considered statistically significant.

DISCUSSION

Recent studies have suggested that late preterm neonates are at a significantly higher risk for morbidities and mortalities compared to term neonates. Hence this group needs special care and attention so as to improve the prognosis. This study has been conducted at Mahatma Gandhi medical College and Hospital, Jaipur with a sample size of 100 late preterm and 100 term infants in duration of one year from April2015 to April 2016. Contrary to the belief that late preterm are nearly mature, the present study proves that late preterm suffer from significant morbidity and mortality.

In our study in late preterm group, 15% were in 34 weeks, 25% in 35 weeks and 60% in 36 weeks. Similar trend was observed in a study by Carla Garcez et al (21) where 19.3% were in 34 weeks gestation, 28.3% in 35 weeks gestation and 52.4% were in 36 weeks gestation.

Out of all term neonates 32% were in 37 weeks, 26% in 38 weeks, 18% in 39 weeks and 24% in 40 weeks. Majority of the population was in term group of 37 weeks followed by 38 weeks. Our study endorses similar findings found in a study by Martin JA et al (8) which proves since 1990, singleton births have increased by 30% at 37-39 weeks whereas at 40 weeks have decreased by 35%.

Among all the babies, caesarean sections (53%) were slightly on higher side as compared to vaginal deliveries (47%) in late preterm in our study and same was observed in study by Jaiswal et al (22) where 32.2% were delivered by vaginal delivery while 67.8% were delivered by caesarean sections. Caesarean sections predominated in studies by Kumari .K et al (23), Breno Fauth de Araujo et al (24), Arulkumaran Arunagirinathan et al (25) and Rohit Modi et al (26) also, like our study.

In term infants 55% were vaginal deliveries and 45% were caesarean sections in our study. Similar findings were seen in Rohit Modi et al (26) where vaginal deliveries were 57.3% and caesarean sections were 42.64%. Jaiswal et al (22) too had similar findings.

In our study male births were higher in both the groups similar to the study of Rohit Modi et al (26), in which late preterm males were 54.6% and females 45.4% and amongst term births, males were 51.12% and females 48.88%.

Mean birth weight in late preterm neonates was 2.357 ± 0.512 kg, where as in term neonates it was 2.789± 0.429 kg. This difference was statistically significant and similar to study by Ghulam Nabi Rather et al (27) where mean birth weight of late preterm was 2.4± 0.6 kg and in term 2.8± 0.6 kg.

In late preterm, 84% were AGA, 12% were SGA and 4% were LGA, whereas in term infants 86% were AGA, 8% SGA and 6% were LGA. Our findings were similar to Jaiswal et al (22) who found that in late preterm group 83.7% were AGA, 10.2% SGA and 6.1% LGA where as in term 85.1% were AGA, 4.9% were SGA and 10% were LGA.

11 late preterm neonates had <7 APGAR at 1 min where as in terms there were only 3 neonates. Also terms had higher mean APGAR at 1 min compared to late preterm 7.86± 0.75 versus 7.57± 1.25 which was statistically significant too. Similarly in Breno Fauth de Araujo et al (24) study, mean 1 minute APGAR scores were 7.4 for the LPTI and 8 for the control group (p<0.0001).

In both the groups there were 1-1 neonate who had APGAR less than 7 at 5 minutes but there was difference in mean APGAR of both groups at 5miutes that is 8.8± 0.586 in late preterm and in term neonates 8.116± 0.455 which was higher than the other group. Jaiswal et al (22) had similar findings where terms had higher mean APGAR that is 8.77 ± 0.5 and late preterm had 8.49 ± 0.6.

Preterm have higher rate of morbidity. In the study by Jaiswal et al (22), he found that 70.8% late preterm had at the least one neonatal morbidity as compared to term in which it was 29.1%. Our study endorses similar findings which were statistically significant: late preterm were twice at risk not to have at the least one morbidity as compared to term. There were 42% in late preterm whereas 21% in term neonates.

Interesting finding was that incidence of morbidity is inversely proportional to gestational age. In a study by Mc Intire et al (28) they found that neonatal morbidity rates decreased progressively and significantly from 34 to 39 weeks of gestation. One or more of these morbidities were diagnosed in 14% of infants born at 39 weeks compared with 34%, 24% and 17% at 34, 35 and 36 weeks of gestation, respectively.

Similarly, in our study, one or more of these morbidities were diagnosed in 60% of newborns at 34 weeks, 28% at 35 weeks and 45% at 36 weeks, whereas at 40 weeks it was 20.8%. Jaiswal et al (22) too had similar findings. Major morbidity in our study was respiratory (25%) which included TTNB, HMD and MAS followed by feeding problems (24%) and then hypothermia (14%) in late preterm, whereas in terms respiratory morbidity was in 9%, feeding problems in 6% and hypothermia in 5%. Difference in all these findings was statistically significant too. Arul Kumaran Arunagirinathan et al (25) in his study found respiratory morbidity (51.7%) as major morbidity. Rohit Modi et al (26) too had major morbidity as respiratory and this can be attributed to their lung immaturity (17).

Grossly, major morbidities were respiratory, jaundice, feeding difficulties and hypothermia in all studies including ours. (Table 2)

In late preterm, 3% died which were similar to study by Ghulam Nabi Rather et al (27) who too had 2.5% deaths in late preterm.

TABLE 1

VARIABLE	LATE PRETERM	TERM
GESTATIONAL AGE IN WEEKS		
34-34+6	15	0
35-35+6	25	0
36-36+6	60	0
37-37+6	0	32
38-38+6	0	26
39-39+6	0	18
40-40+6	0	24
CAESAREAN SECTION	53	45
VAGINAL DELIVERY	47	55
FEMALE	48	46
MALE	52	54
MEAN BIRTH WEIGHT(KG)	2.357	2.789
ELBW	1	0
VLBW	5	0
LBW	43	19
AGA	84	86
LGA	4	6
SGA	12	8

TABLE 2

VARIABLES	LATE PRETERM (N=100)	TERM (N=100)	TOTAL	pVALUE
TOTAL MORBIDITY	42	21	63	**0.002 S**
APNEA	5	1	6	0.214 NS
BA	3	1	4	0.61 NS
NNS	4	1	5	0.36 NS
NNJ	11	4	15	0.10 NS
HYPOGLYCEMIA	2	1	3	1.0 NS
HYPOTHERMIA	14	5	19	**0.05 S**
FEEDING PROBLEMS	24	6	30	**<0.001S**
NEED FOR IVF	10	6	16	0.43 NS
RESPIRATORY MORBIDITY	**25**	9	34	0.225 S
TTNB	10	3	13	0.085 NS
MAS	4	6	10	0.74 NS
PPHN	1	0	1	1.0 NS
HMD	11	0	11	**0.002 S**
ASPIRATION	1	0	1	1.0 NS
DEATH	3	0	3	0.24 NS

CONCLUSION

In the present study, we conclude that late preterm neonates are significantly at higher risk of developing morbidity and mortality as compared to term neonates.

Although, late preterm look like terms, but still physiologically and metabolically are immature and at risk and are many times neglected and not given special care so more prone to morbidities and in turn mortality also.

This vulnerable group should be closely monitored, preferably planned for safe discharge and advised early and frequent pediatric follow up.

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