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Prevalence of Transient Tachypnea of Newborn: A Prospective Study

			
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ABSTRACT

Objective: To assess the prevalence, risk factor, severity and management of transient tachypnea of newborn. **Method:** 62 neonates was admitted with TTNB, the maternal and neonatal clinical examination and history was collected in a predesigned data entry form. The percentage was calculated by using MS excel. **Result:** There were total 2407 hospital delivery out of which 62 neonates were admitted in SNCU and NICU with TTNB that constituted about 2.57 % of all hospital deliveries. Most of neonates were late preterm (24.19%) and early term (40.13%). Majority of the delivery was cesarean section delivery (61.29%) than vaginal delivery (38.70%). Severity was assessed 93.54% had mild TTNB. TTNB was managed with oxygen therapy and antibiotics. **Conclusion:** Cesarean section delivery is a predisposing risk factor to TTNB and proper obstetric care would help to reduce Cesarean section delivery to some extent.

INTRODUCTION

Transient tachypnea of newborn is also known to be wet lung which is one of the major cause of respiratory distress in neonates.¹ Transient tachypnea of newborn has an estimated frequency of 1% to 2% of all neonates.² It is mostly seen in both term (more than 36 week) and late preterm (34-36 week) of neonates. Transient tachypnea of newborn is a momentary respiratory distress which usually settles down within 48-72 hours of newborn life. It leads to respiratory distress in neonates due to inadequate or incomplete alveolar fluid clearance from the lungs of newborn.³ In utero alveolar fluid is required for the growth and development of the lungs of neonates. As the transition takes place from intrauterine to extrauterine life of neonates these alveolar fluid need to get reabsorbed or cleared from the lungs. This excess fluid in the lungs result in reduced lung compliance and more resistance to the flow of air in the lungs. It is usually characterised by the presence of tachypnea (> 60 breaths per minute), grunting, retraction and nasal flaring.⁴ Various studies also suggest that the transient tachypnea of newborn as a risk factor for subsequent wheezing illness in early life. There are also studies which show an association of Transient tachypnea of newborn and childhood asthma.⁵

The main objective of the study is to assess prevalence, risk factor, severity and management of transient tachypnea of newborn.

MATERIALS AND METHODS

STUDY SITE

A hospital based prospective study was conducted at different hospital in Palakkad both government and private sector hospital. Government Women and Children Hospital, Palakkad District and Paalana Institute of Medical science, Palakkad, Kerala.

STUDY DURATION

The study was conducted for a period of 5 month (November 2018- March 2019).

STUDY POPULATION

A total of 62 neonates with transient tachypnea of newborn.

STUDY CRITERIA

Inclusion criteria: Baby less than 28 days, Chest X-ray suggestive of transient tachypnea of newborn, newborn greater than 34 weeks of gestation, newborn who satisfy the characteristic of transient tachypnea of newborn.

Exclusion criteria: Baby greater than 28 days, newborn less than 34 weeks of gestation, parents not willing to enrol in the study.

DATA COLLECTION

Signed informed consent was taken from mother or guardian of each infants recruited in the study. A predesigned data entry form was used to collect detailed history and clinical examination of neonates and mother. Severity was assessed by using Downe's score in term neonates and Silverman Anderson score in preterm neonates. Data were sorted and percentage was calculated by using Microsoft excel.

RESULTS

During the study period a total of 62 neonates were admitted with transient tachypnea of newborn. The total no of hospital deliveries was 2408 live newborn in which TTNB constituted about 2.57 % of all hospital deliveries. A total of 118 neonates admitted with respiratory distress in NICU and SNCU of the hospital out which 62 neonates had TTNB.

Table 1: Gender wise distribution:

Sl. No	Gender	No. of Neonates (n=62)	Percentage %
1.	Male	40	64.51%
2.	Female	22	35.48%

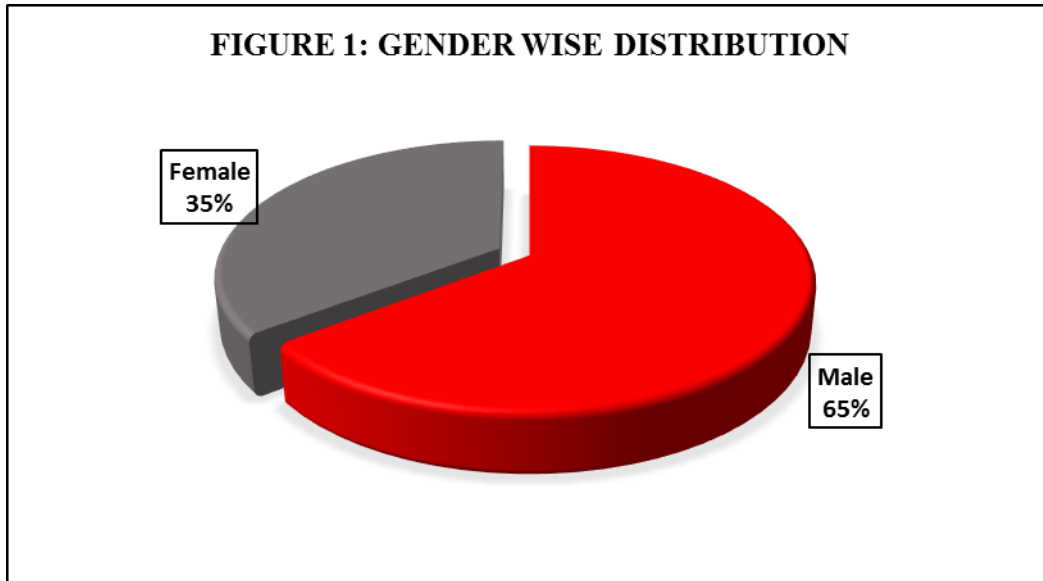


Table 2: Distribution according to Gestational age of neonates

Sl.no	Gestational age (week)	No. of neonates (n=62)	Percentage %
1.	<36	15	24.19 %
2.	37-38	25	40.13 %
3.	Greater than 39 week	22	35.48 %

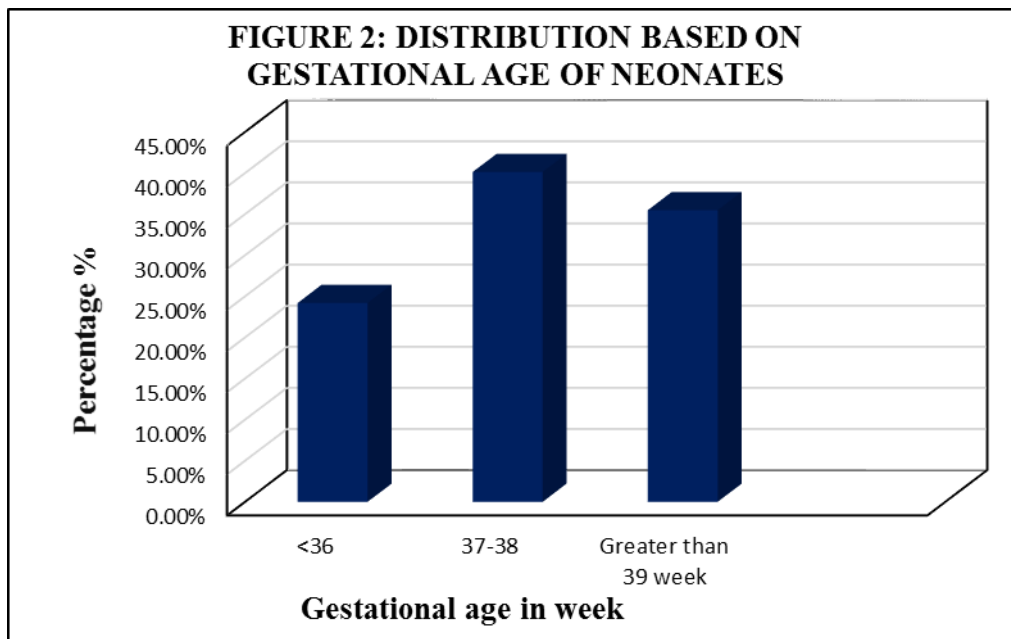


Table 3: Distribution according to Birth Weight

Sl. No	Birth weight (Kg)	No. of neonates (n=62)	Percentage %
1.	< 2.499	48	77.41
2.	2.5-3.999	10	16.12
3.	> 4	4	6.45

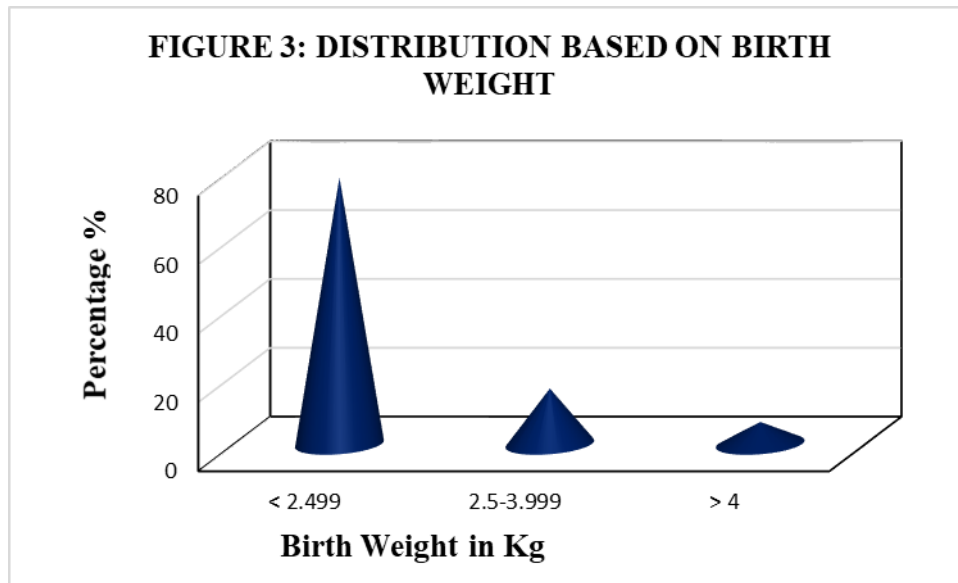


Table 4: Distribution based on Maternal Demographic Characteristics

Variables	No. of mothers (n=62)	Percentage %
Age in years		
<20	2	3.22%
20-24	22	35.48%
25-29	27	43.54%
>30	11	17.74%
BMI (Kg/m²)		
<18.5	1	1.61 %
18.5-24.9	29	46.77%
25.0-29.9	24	38.70 %
>30	8	12.90 %

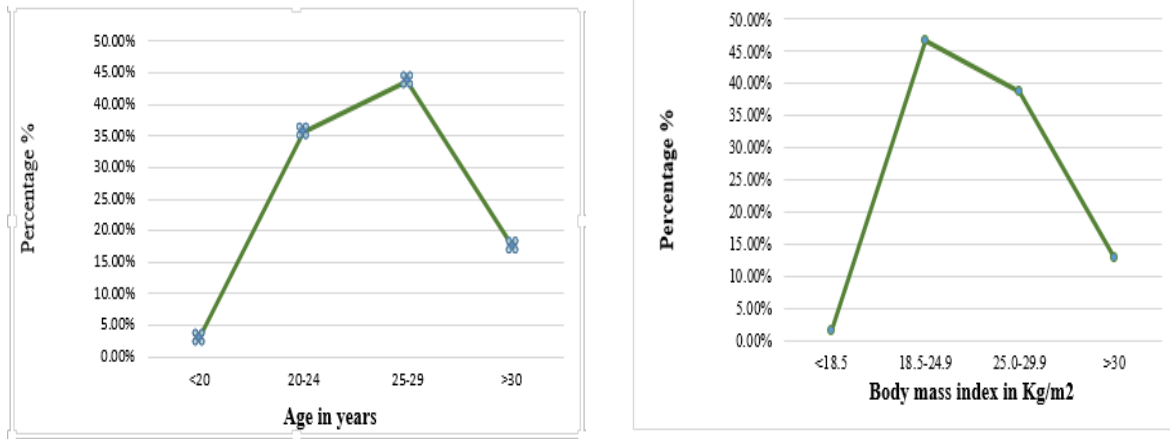


FIGURE 4: DISTRIBUTION BASED ON MATERNAL DEMOGRAPHIC CHARACTERISTICS

Table 5: Distribution based on Mode of Delivery

Sl. no.	Mode of delivery	No of neonates (n=62)	Percentage %
1.	Vaginal	24	38.70%
2.	Caesarean	38	61.29%

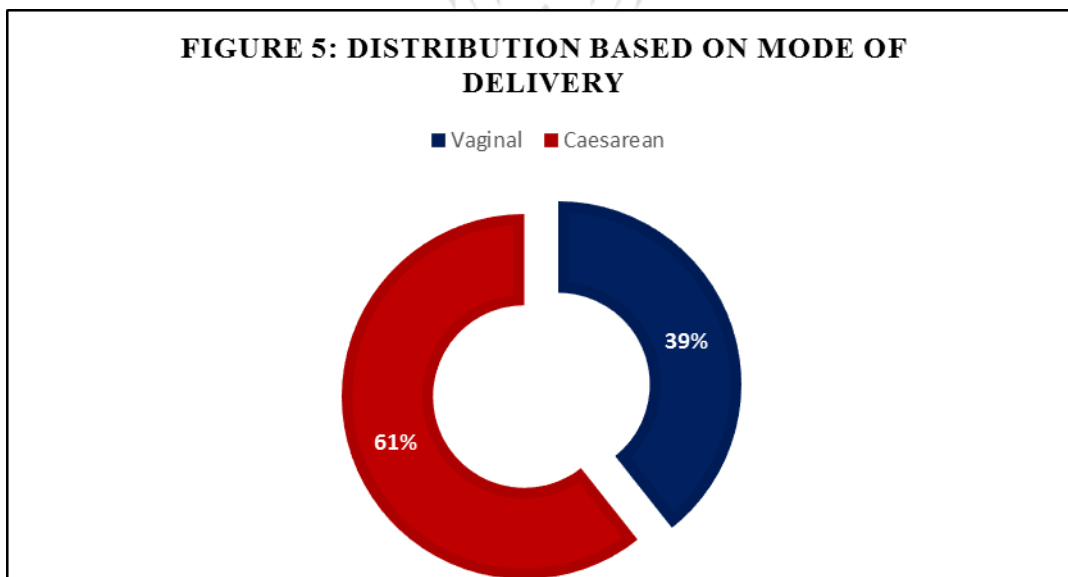


Table 6: Distribution based on Maternal Complication:

Sl. No.	Maternal complication	No. of mother n=62	Percentage %
1.	Premature rupture of membrane	13	20.96%
2.	Gestational diabetes	6	9.67%
3.	Pregnancy induced hypertension	4	6.45%
4.	Hypothyroidism	7	11.21%
5.	Oligohydramnios	19	30.64%
6.	Polyhydramnios	1	1.61%
7.	Meconium staining amniotic fluid	10	16.12%
8.	Intrauterine growth retardation	3	4.83%
9.	Abruption placenta	1	1.61%
10.	Foetal distress	4	6.45%
11.	Anaemia	1	1.61%
12.	Maternal Fever	1	1.61%

**n=62; Total will not correspond to 100% because of multiple maternal complications.*

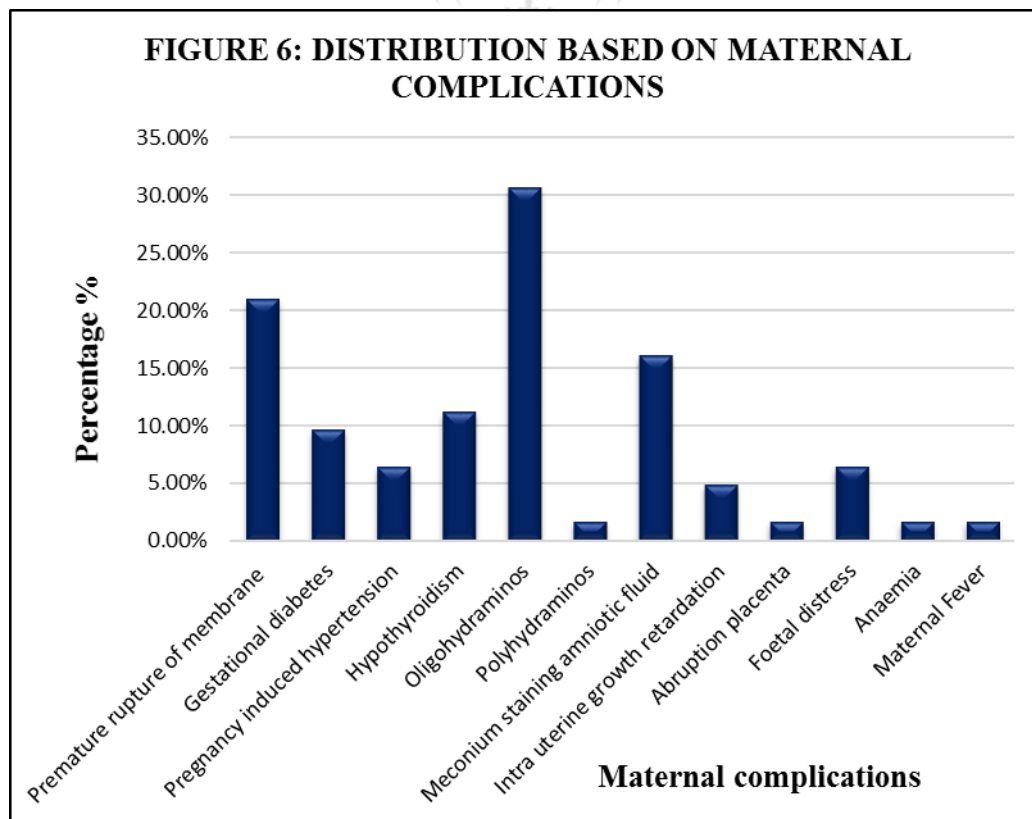


Table 7: Distribution based on Severity

Sl. No.	Severity	No. of neonates (n=62)	Percentage %
1	Mild	58	93.54%
2	Moderate	4	6.45 %
3	Severe	0	0 %

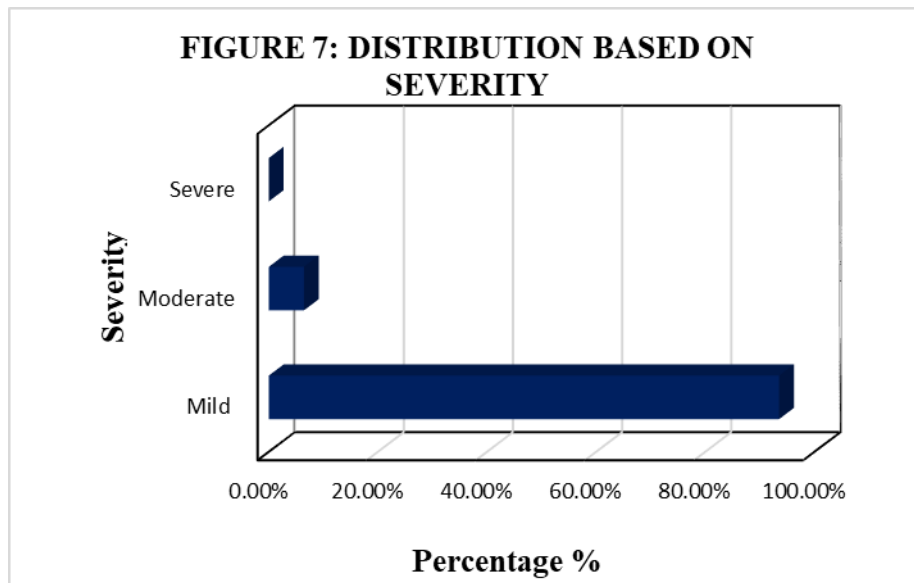


Table 8: Distribution based on Treatment

Sl. No.	Treatment	No. of neonates (n=62)	Percentage %
1.	Hood	53	85.48 %
	Nasal prong	5	8.06 %
	Nasal CPAP	4	6.45 %
2.	Intravenous fluid	62	100%
3.	Antibiotic therapy	13	20.96%

*n= 62; Total will not corresponds to 100 % due to multiple therapy

CPAP: Continuous positive airway pressure

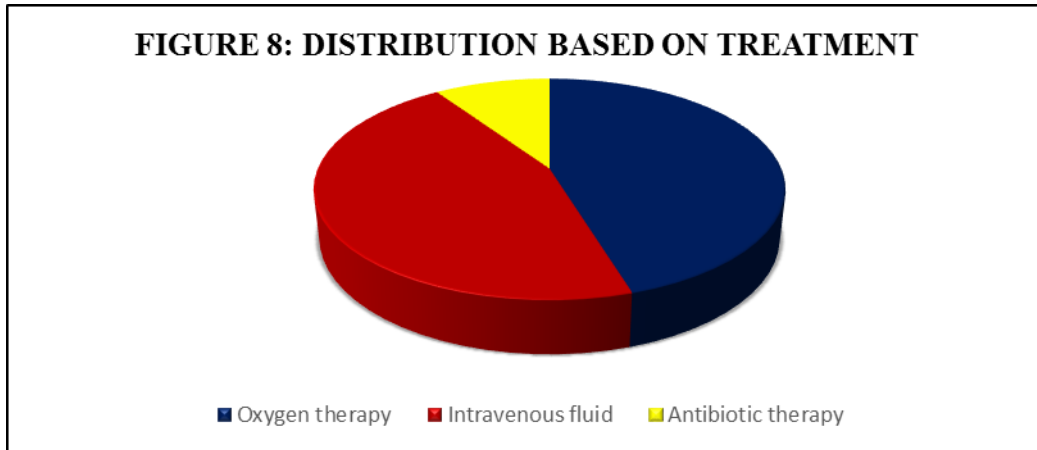
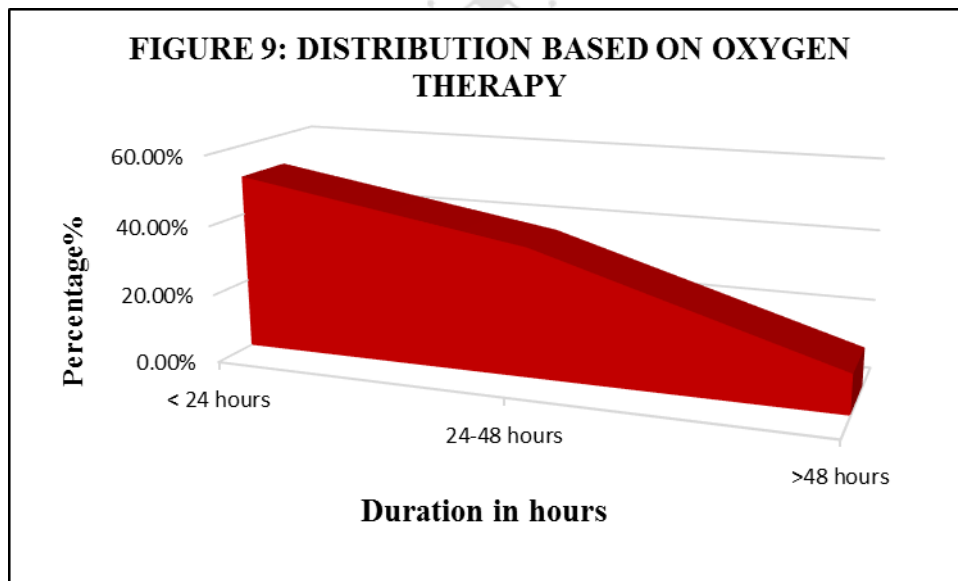


Table 9: Distribution based on duration of Oxygen Therapy

Sl. No.	Duration in hours	No. of neonates (n=62)	Percentage %
1.	< 24 hours	32	51.06%
2.	24-48 hours	23	37.09%
3.	>48 hours	7	11.29%



DISCUSSION

The prevalence rate in this study was 2.57 % which is similar as Thomas A.Parker *et al* indicated incidence of transient tachypnea of newborn between 0.5 % to 4%.

Table: 1 and Figure 1 shows distribution of neonates according to gender. 64.5% male gender developed transient tachypnea just after birth than female neonates (35.4%). C. Dani *et al*

conducted a study regarding this and concluded that male sex is one of the risk factor for Transient tachypnea of newborn. This can be described as male have reduced number of alveolar sodium transport than female which leads to fluid accumulation in male neonates.²

Table: 2 and Figure 2 shows the distribution of neonates according to gestational age. Neonates in the gestational age group between 34-36 week (24.19%) and 37-38 week (40.13%) are more prone to transient tachypnea of newborn. Lokesh gulgani *et al.* concluded that infant born late preterm (34-36 week) and early term (37-38 week) the risk of transient tachypnea of newborn increases.

Table 3: and Figure 3 describe the distribution of birth weight of neonates. In this study, 77.4 % of neonates with transient tachypnea are of low birth weight. P. Brahmaiah *et al.* conducted a study on respiratory distress in which transient tachypnea was the major cause of distress and established that low birth weight is a significant risk factor.

Table 4 and Figure 4 shows distribution pattern based on demography of mother. This study shows that most of the mother was in the age group of 25-29 years that is 43.54% whereas 38.07 % of mother was overweight and 12.09% was obese. Wei-Shang *et al* concluded maternal age > 30 years was an independent risk factor for transient tachypnea of newborn. The epidemiological dissimilarity may be the reason for this distinct pattern.

Table 5 and Figure 5 represents the distribution according to mode of delivery. In present study, 61.29 % of neonates that is more than half of the mother had gone cesarean section delivery which was in accordance with the study of Eman F.Badran *et al* concluded that cesarean section delivery is a major risk factor for respiratory morbidity in newborn. D.I. Tudehope *et al.* also established that a cesarean section delivery is a major risk factor for development of transient tachypnea in neonates. This can be described as reduced amount of catecholamine after cesarean section delivery which modify epithelial Na⁺ Channel function involved in absorption of fluid from lungs.²

Table 6 and Figure 6 indicates distribution of maternal complication of neonates with transient tachypnea. In this study, it was found that 30.64 % of oligohydramnios and 20.6 % of Premature rupture of membrane. According to Sodwat *et al.* there was no association of transient tachypnea of newborn with premature rupture of membrane, foul smelling liquor, oligohydramnios. Other maternal complications was gestational diabetes mellitus, pregnancy induced hypertension, hypothyroidism, anemia, foetal distress. Wei-Shang Chang *et al*

concluded that pregnancy induced hypertension have an increased risk of developing transient tachypnoea of newborn in infants. Persona B *et al* concluded that transient tachypnea three times more in infants of diabetic mother. The difference in the result may be due to epidemiological variation.

Table 7 and Figure 7 shows distribution on severity of transient tachypnea which was assessed by using downe's score for term and silverman anderson score for late preterm. 93.54 % of neonates had mild respiratory distress and 6.45 % had moderate respiratory distress. Sahoo M R *et al* also studied the severity of respiratory distress in which majority of neonates had mild severity of transient tachypnea.

Table 8 and Figure 8 indicates the distribution pattern based on treatment of transient tachypnea of newborn . All neonates was managed with intravenous fluid and oxygen therapy in which 85.48% received oxygen through hood, 8.06 % received through nasal prong and 6.45 % neonates received through nasal CPAP. Out of 62 neonates 13 (20.96%) received antibiotic (ampicillin and gentamycin) addition to oxygen and intravenous fluid in which 11 neonates CRP was positive, antibiotic was mainly prescribed in view of visible risk factor for sepsis. Andrea S.Weintrub *et al* concluded that empirical postnatal antibiotic cannot be given to neonates with transient tachypnea under nonexistence of infectious risk factor.

Table 9 and Figure 9 represents the duration of oxygen therapy which shows that 51.06% of neonates required oxygen therapy less than 24 hours. Chandrashekhar R *et al.* described that majority required oxygen less than 24 hours as transient tachypnea was the major cause of respiratory distress which does not require more oxygen due to reduced severity.

CONCLUSION

The study was aimed to assess the prevalence, risk factor, severity and management of TTNB. The prevalence rate of TTNB was found to be 2.57%. According to the result, risk of TTNB was more in male sex, low birth weight and cesarean section delivery. TTNB was more prevalent in late preterm and early term neonates. TTNB had mild severity in most of the cases. Neonates with TTNB was managed with oxygen therapy, intravenous fluid and antibiotics. TTNB had good recovery in most of the babies, there was no mortality reported. Due to intrapartum complication risk of cesarean section delivery is on high rate. Good obstetric care and analysis of indication of cesarean is required in order to reduce the incidence of TTNB.

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