



ETIOLOGY AND OUTCOME OF NEONATAL APNEA IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Apnoea is the most frequent type of breathing disorder in neonatal period frequently prolonging hospitalization and needing cardiopulmonary monitoring. The definition of apnoea has been changing in the past years due to new findings on its physiopathology. Apnoea typically resolves before 37 post menstrual weeks in infants delivered after 28 weeks gestation. However, in infants born before 28 weeks, apnoea frequently persists after term post menstrual age. A total of 104 neonates suffering from apnoeic episodes admitted to our NICU were studied in detail to know various underlying aetiologies and their outcome. The neonates who fulfilled the following criteria were selected for the study group. Out of 104 neonates; which formed the study group majority of neonates are preterm(n=73;70%) and most of apnoeic episodes occurred in day-2 to day-7 of life(n=77;74.03%). Neonatal sepsis was the predominant cause (n=42;40.3%) observed in the study group followed by apnoea of prematurity (n=31;29.8%). Apnoeic episode is inversely co-related to gestational age and birth weight. The mean birth weight and gestational age were 1553.09 ± 310.25gm and 32.61± 1.6 weeks for the infection group and 1138±205.06gm and 29.96±1.8 weeks for the apnoea of prematurity group. Early recognition by careful observation, assessment of risk and subsequent therapy will have a good outcome. Hence it is of utmost importance that careful monitoring, early intervention and follow up care of high-risk neonates, who are more prone for apnoea as this study supports.

Keyword – Apnoea of prematurity(AOP), neonatal sepsis; prematurity.

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INTRODUCTION:

Apnoea is the most frequent type of breathing disorder in neonatal period frequently prolonging hospitalization and needing cardiopulmonary monitoring. The definition of

apnoea has been changing in the past years due to new findings on its physiopathology. Apnoea has been defined by the **American Academy of Pediatrics;2003** as “an unexplained episode of cessation of breathing



for 20 seconds or longer; or a shorter respiratory pause associated with bradycardia; cyanosis; pallor; and or marked hypotonia.”

This must be distinguished from periodic breathing; which is defined as periods of regular respiration for as long as 20 seconds followed by apnoeic periods longer than 10 seconds.

Apnoea in preterm infants is usually related to immaturity of the central nervous system and is called apnoea of prematurity(AOP). Although there is considerable variation in incidence and severity of apnoea in premature infants, both are inversely related to gestational age.

Apnoea typically resolves before 37 post menstrual weeks in infants delivered after 28 weeks gestation. However, in infants born before 28 weeks, apnoea frequently persists after term postmenstrual age. Outcome depends on the underlying cause. Treatment is supportive and correction of underlying cause. If the underlying aetiology for the apnoea is treated; most of the pathologies have good outcome.

REVIEW OF LITERATURE:

- 1) **Morton SU et al.**, suggested that Apnoea of Prematurity (AOP), affects almost all infants born at <28weeks gestation or with birth weight <1000g. When untreated, AOP may be associated with negative outcomes. Hence judicial evaluation and careful monitoring is warranted.
- 2) According to **Zhao J et al.**, the lower the gestational age, the longer the period that AOP persists. AOP disappears in most infants by 36 to 40 weeks postconceptional age. However, extremely premature infants (24–28 gestational weeks) are at risk for

experiencing apnoea beyond 38 to 40 weeks postconceptional age.

METHOD:

The present study was conducted in the Department of Paediatrics,SreeBalaji Medical college & Hospital. A total of 104 neonates suffering from apnoeic episodes admitted to our NICU were studied in detail to know various underlying aetiologies and their outcome,the neonates who fulfilled the following criteria were selected for the study group. Neonates presenting with an unexplained episode of cessation of breathing for 20 seconds or longer, or a shorter respiratory pause associated with bradycardia(< 80 beats/ min); cyanosis, pallor;O₂saturation <85% and/or marked hypotonia. Neonates with periodic breathing and subtle seizures were excluded from the study.Our workup included proper history clinical examination and detailed investigation. We used new Ballard scoring system for assessment of gestational age.Investigations include blood culture; complete blood count; arterial blood gas analysis;chest x-ray and neuroimaging.

RESULTS:

Out of 104 neonates; which formed the study group majority of neonates are preterm(n=73;70%) and most of apnoeic episodes occurred in day-2 to day-7 oflife(n=77;74.03%). Neonatal sepsis was the predominant cause (n=42;40.3%) observed in the study group followed by apnoea of prematurity (n=31;29.8%). Apnoeic episode is inversely co-related to gestational age and birth weight. The mean birth weight and gestational age were 1553.09 ± 310.25gm and 32.61±1.6 weeks for the infection group and 1138±205.06gm and 29.96±1.8 weeks for the apnoea of prematurity group.

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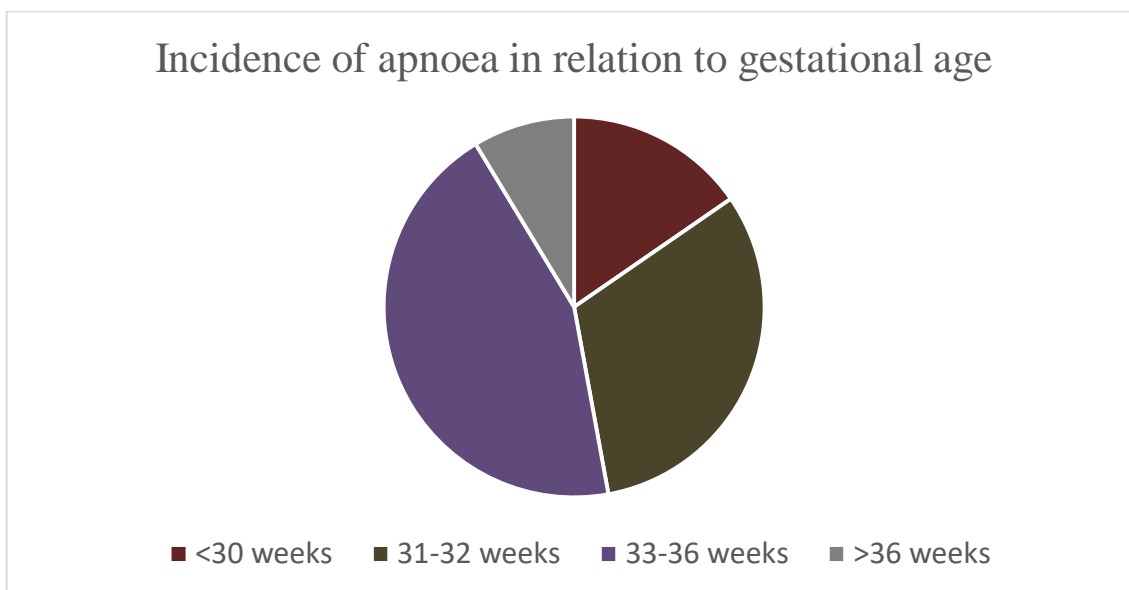


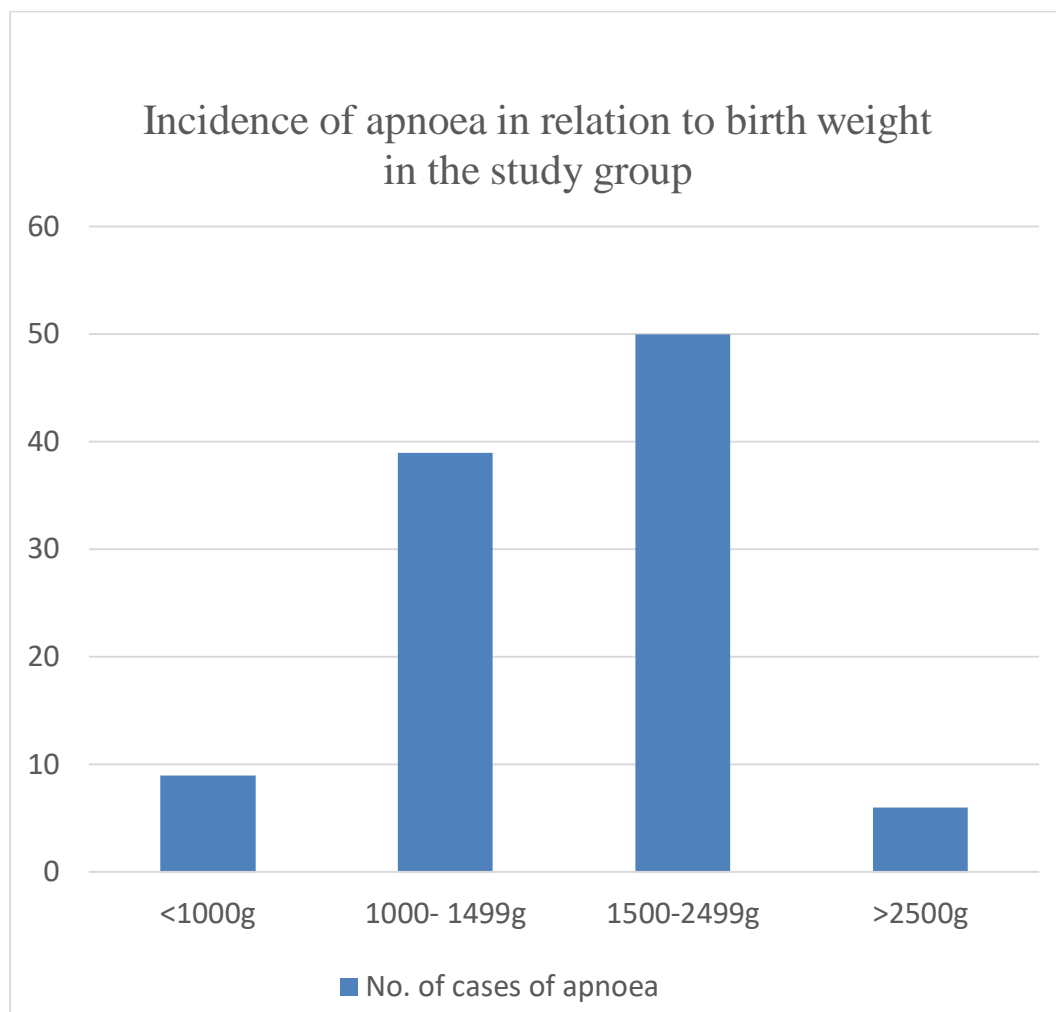
Fig 1

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Gestational age	'n'	Frequency
<30 weeks	16	57.6%
31-32 weeks	33	31.7%
33-36 weeks	46	44.2%
>36 weeks	09	8.6%

Table 1





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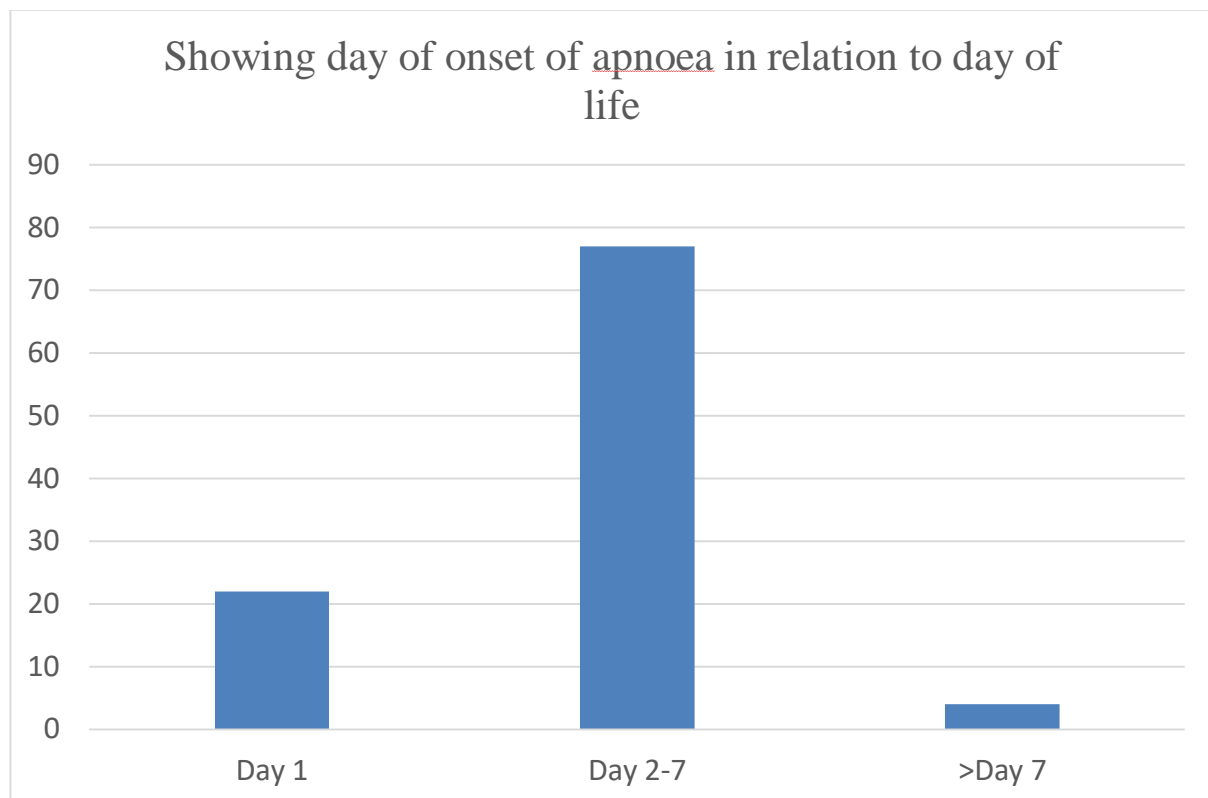
Fig 2

Birth weight	'n'	Frequency
<1000g	09	8.6%
1000-1499g	39	37.5%
1500-2499g	50	48%



>2500g	06	5.7%
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Table 2



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Fig 3

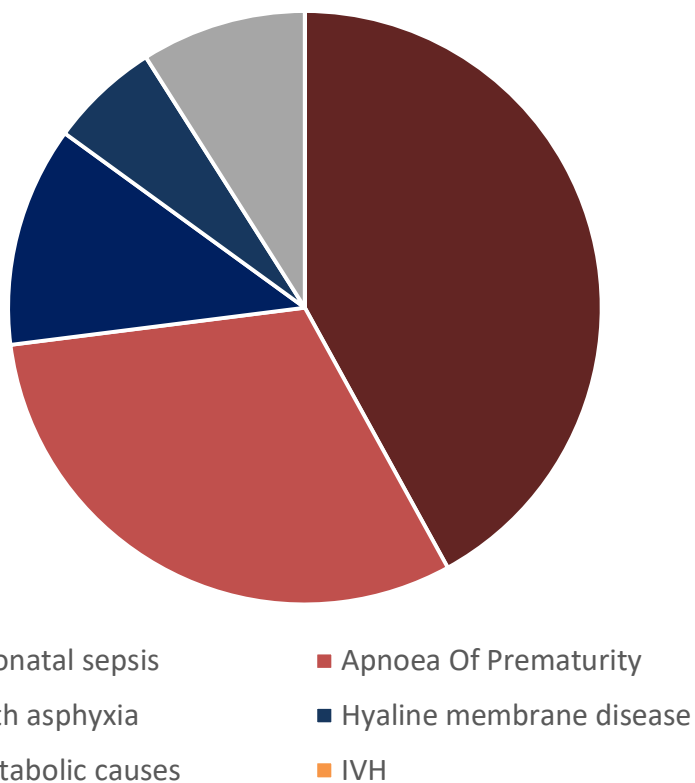
Day of Onset	'n'	Frequency
Day 1	23	22.11%



Day 2 - 7	77	74.03%
>Day 7	04	3.84%

Table 3

Incidence of apnoea in relation to various aetiologies



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Fig 4

Aetiology	'n'	Frequency



Neonatal sepsis	42	42.3%
Apnoea Of Prematurity	31	29.8%
Birth asphyxia	12	11.5%
Hyaline membrane disease	6	5.7%
Metabolic causes	9	8.6%
Intraventricular haemorrhage	2	1.9%

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Table 4

DISCUSSION:

The present study is proposed to evaluate the aetiology of apnoea and its outcome. This study was carried out in Department of Paediatrics, SreeBalaji Medical college & Hospital from August 2020 – September 2021. The study group consisted of 104 neonates; the purpose of this study is to find out various aetiologies of apnoea; their response to treatment & outcome. Out of 104 cases, majority of neonates are preterm (n=71; 68.2% Table 1). Apnoea in newborns is directly correlated to prematurity & birth weight (Table 2). Mean birth weight and gestational age for apnoea of prematurity group was the mean birth weight and gestational age were 1553±310.25gm and 32.6±1.6 weeks for the infection group and 1138±205.06gm and 29.96±1.8 weeks for the apnoea of prematurity group. It was observed the most common days of life having apnoeic

episode day 2-day 7 (n=77; 74.03%); day 1 of life (n=22; 22.11%); day more than 7 (n=4 3.84% Table 3). The frequency of apnoea when calculated according to gestational age; it was 57.6% < 30 weeks; 31.7% in 31-32 weeks; 44.2% in 33-36 weeks and 8.6% is more than 37 weeks of gestational age. In our study the commonest cause of apnoea was neonatal sepsis (n=42; 40.3%). Out of these most were premature (n=71; 68.2%). Hence it is imperative that infection is definitely ruled out or diagnosed and treated in all cases of recurrent apnoea. Various miscellaneous causes like birth asphyxia (n=12; 11.5%); hyaline membrane disease (n=6; 5.7%); metabolic causes (n=9; 8.6%) IVH (n=2; 1.9%) have also been implicated.

Investigations performed includes hemogram; blood glucose; septic screen; blood culture and neuroimaging were done whenever indicated. The treatment



administered included tactile stimulations; aminophylline and ventilation whenever indicated. Finally, the data was analysed for the incidence; cause and outcome of babies with apnoea. Out of the 104 cases 28 had gone LAMA; remaining 76 cases total number of survival were n=37; 48.68%) majority of cases (n=28; 26.9%) went LAMA during course of treatment.

CONCLUSION:

Apnoea in neonates may be manifestation of many serious underlying diseases as well as may be due to prematurity. Apnoea of prematurity is essentially a diagnosis of exclusion, and carries the most excellent prognosis. Neonates with apnoeic spells should be evaluated to exclude secondary causes of apnoea like sepsis, hypoglycaemia and intracranial haemorrhage etc., because sepsis remains the commonest cause of apnoea and carries a poor prognosis. Early recognition by careful observation, assessment of risk and subsequent therapy will have a good outcome. Hence it is of utmost importance that careful monitoring, early intervention and follow up care of high-risk neonates, who are more prone for apnoea as this study supports.

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