



A PROSPECTIVE STUDY OF ROLE OF THIAMINE IN PRIMARY PULMONARY HYPERTENSION IN YOUNG INFANTS PRESENTING WITH RESPIRATORY DISTRESS

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ABSTRACT

20 young infants were seen over a period of one year from January 2019 to December 2019 with PPHN and Respiratory distress. All babies were initially offered Therapeutic administration of Thiamine and looked for responsiveness. Six out of 20 (30%) infants were responsive to thiamine and 66.67% of responders did so with in 48 hours and the rest of responders (33.33%) did so in another 24 hours' time. 83.33% of Thiamine responsive PPHN were from Low socioeconomic group necessitating Thiamine administration to mothers also. This study highlights the importance of recognizing easily treatable cause of PPHN and also the magnitude of the problem in Low socioeconomic status families. Therapeutic administration of Thiamine is diagnostic.

KEYWORDS :**INTRODUCTION**

Primary pulmonary hypertension (PPHN) is an important cause of Respiratory distress in young infants presenting to the Emergency medicine department. Though varied causes are attributed to causation like neonatal respiratory support on Mechanical ventilation with high Fio2 of more than 60%, resulting bronchopulmonary dysplasia and PPHN. In some resource limited settings and in infants born to low socioeconomic status Thiamine deficiency was found to be an important easily treatable cause of PPHN as almost 27-78% in mothers and 15-58% in children are found to be deficient in thiamine^{1,2,3}. Hence this prospective observational study was undertaken to evaluate the incidence and usefulness of Thiamine therapy in PPHN.

MATERIALS AND METHODS

20 young infants were seen with PPHN in Emergency unit of dept of pediatrics, Kurnool Medical College, Kurnool from January 2019 to December 2019. Young infants with respiratory distress were evaluated for PPHN with the help of 2D echo cardiogram. When once the diagnosis of PPHN was made all babies were offered Thiamine in a dose of 50mg IV once a day for 3days. All babies are then followed, and serial examinations were done to follow trends in Respiratory rate, need for oxygen, Chest retractions, changes in skin color and for pressure changes in Right ventricle, Pulmonary arterial pressures and for changes in Tricuspid regurgitation. The thiamine responsive ness was recorded in terms of hours required for respiratory distress to come down and to be off oxygen in hours. Rest of babies who did not respond to thiamine are then subjected to Unit protocol therapy for PPHN. SSP statistical software was used to analyze the data.

RESULTS AND DISCUSSION**Table 1: - Cases in relation to Age group and sex**

Age group	Male	Female	Total	Comments
4weeks- 8 weeks	1	1	2 (10%)	
8week-12 weeks	8	3	11 (55%)	
3+mon- 6months	3	2	5 (25%)	
>6months	1	0	1 (5 %)	7 th month
Total	13	7	20 (100%)	

Majority of infants are in the age group of 1 to 6 months only ie. 19infants out of 20 (95%). Only one infant was seen in 7th month of life. 65% of infants were male infants compared to only 35% of female infants.

Age in months (mean±SD) (range) 3.2±1.2 (1-7) was reported by Sastri UMK etal⁴

Table: - 2 Cases in relation to Respiratory distress and SPO2 values

Clinical parameter	Number of Infants	Percentage
Respiratory distress	20	100%
SPO2 <90%	5	25%
SPO2 (91 to 93%)	10	50%
SPO2 (94% or more)	5	25%

75% of infants had severe respiratory distress with SPO2 of less than 94%. Only 5 infants were maintaining saturations above 93%.

Table 3:- Cases in relation to Thiamine responsiveness or Non-Responsiveness

Thiamine responsiveness	Number of cases	Percentage
Responded	6	30%
Not Responded	14	70%
total	20	100%

Out of 20 infants 6 infants responded to Thiamine administration accounting for 30% and rest of infants were Non-Responders ie. 14 out of 20 infants (70%) to Thiamine administration.

Table 4: - Cases in relation to thiamine responsiveness in number of hours

Thiamine Responsiveness	Number of Hours for responsiveness	Number of cases	Percentage
Responsive	<24 hours	1 (n=6)	16.67%
	24 - 48 hours	3 (n=6)	50%
	48 - 72 hours	2 (n=6)	33.33%
Non-Responsiveness	<72 hours	0 (n=14)	0%
	>72 hours	14 (n=14)	100%

Out of 20 infants presenting with PPHN and Respiratory distress 6 babies (30%) have responded to Thiamine administration and the rest of infants did not respond to thiamine (14 infants out of 20 accounting for 70%).

Out of the 6 infants with thiamin responsiveness around 66.67% responded with in 48 hours in the form of coming out of tachypnea range and off supplemental oxygen. Another 33.33% responded in another 24 hours.

The Non-Responders to thiamine were started on alternate modes of therapy for PPHN as per Unit policy.

Table 5:- cases of Thiamine responsive PPHN in relation to Socioeconomic status

Socio Economic group	Number of cases	Percentage
Low-income group	5 (n=6)	83.33%
Middle income group	1 (n=6)	16.66%
High income group	0 (n=6)	0
Total	6	100%

Majority of infants (5infants out of 6 accounting for 83.33%) with Thiamine responsiveness were born to mothers in Low socioeconomic group reflecting probable thiamine deficiency status in poor mothers. Accordingly, mothers were also treated along with babies.

Historical evidence⁴

Table 2 Thiamine deficiency in infants—historical evidence Period Geographical area Type of report Numbers Authors 1987-1990 Thailand—Karen refugees Infant mortality 183 per 1000 to 78 per

1000 Luxemburger et al¹⁸ 1906–1930 Manila Infant mortality rate 476.17 to 160.24 Albert¹² 1931 Philippines Infant mortality in the community 12 000 to 20 000 infant deaths due to beriberi Report of League of Nations²⁷ 1931 Philippines Case series 514 infants Albert¹³ 1936 Singapore Case series 139 infants/77 deaths Haridas²⁸ 1954–1958 Philippines 15 200 infant deaths Williams²⁹ 2005 Israel Case series 8 infants Fattal-Valevski et al³⁰ 2007–2009 Laos, Thailand Case series 85 infants approximately/20 deaths Barennes et al⁷ 2010 Southern India (Hyderabad) Case series 55 infants Rao and Chandak⁴ 2016 Northern India (Kashmir) Case series 29 infants/4 deaths Bhat et al⁵ 2017 India (Kashmir) Case series 23 infants Qureshi et al⁶ by copyright. on March 31, 2021 at India:BMJ-PG Sponsored. Protected http://adc.bmj.com/ Arch Dis Child: first published as 10.1136/ar

CONCLUSIONS

1. 20 young infants were seen with PPHN and respiratory distress over a period of one year
2. Thiamine therapeutic administration offered to all infants
3. 30% were found to be Thiamine responsive
4. 66.67% of Thiamine responsiveness occurred within 48 hours and another 33.33% with in another 24 hours' time
5. 83.33% of Thiamine responders were from Low-income group.

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