

A CROSS SECTIONAL STUDY ON THE THYROID PROFILE OF NEONATES BORN TO HYPOTHYROID MOTHERS IN A TERTIARY CARE CENTRE IN CHENNAI

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ABSTRACT

Retrospective study was done to estimate the prevalence of congenital hypothyroidism (CH) among new born babies born to hypothyroid mothers on thyroxine in ACS Medical College & Hospital. Datas were collected from the case sheets in medical record department. The prevalence of CH was 1 in 2500 live births with no gender difference.

KEYWORDS: Congenital Neonatal Hypothyroidism, New Borns, Hypothyroidism in Antenatal Mothers, No Gender Difference

Congenital hypothyroidism (CH) occurs approximately 1:2000 to 1:4000 new borns. The clinical manifestations are often subtle and not present at birth. This is likely to be due to the transplacental passages of some maternal thyroid hormones while many infants have some thyroid production of their own. CH is one of the most common preventable causes of mental retardation. Among thyroid hormones if free T₄ level is low and TSH level is elevated a diagnosis of CH is confirmed. The prevalence of CH generally has no relationship with maternal hypothyroidism state & treatment with thyroxine in antenatal mothers. New borns can have devastating neurodevelopmental consequences if not detected and treated promptly. Screening procedures for CH have developed in many countries & it has virtually eradicated intellectual disability due to severe CH. Screening has resulted in increased detection of mild CH. The underlying cause remains obscure in many cases. Thyroid hormone is essential for normal growth & neurological development particularly in the first few years of life. Hypothyroidism during this period may damage the growth & development.

MATERIALS AND METHODS

From new borns blood is taken by prick method for screening. Blood is collected between 2-5 days preferably after 72 hours. Estimation is done by ELISA method. New borns with abnormal results are reviewed and venepuncture blood samples are drawn for confirmation. Free T₄, TSH results are compared to age normal reference ranges & treatment should be started as early as possible. The present study was conducted in the department of paediatrics & in neonatal intensive care unit. ACS Medical College & Hospital from January

2016 to September 2019. It was a retrospective study of congenital hypothyroidism. Proforma was used to record information on age, sex, birth weight, mode of delivery, antenatal mother on thyroxine (regular/irregular) treatment. Investigations like free T₃, T₄, TSH levels were estimated.

Inclusion Criteria

New borns between 2-5 days born to hypothyroid mothers were included.

Exclusion Criteria

New borns below 48 hours & above 5 days were excluded.

Table 1: Background Variables of The Study Subjects

Variable	Classification of Variable	Number (out of 80)	%
Mode of birth	Vaginal	8	10
	C- section	72	90
Gender	Male	39	48.8
	Female	41	51.2
Birth weight	< 3 kgs	61	76.3
	≥ 3 kgs	19	23.7

Table 2: Thyroid profile of the study subjects

Parameter	Mean	Standard Deviation, Standard Error	95% C. I
T-3	1.09	0.53, 0.06	0.97 – 1.21
T-4	7.75	3.47, 0.39	6.99 – 8.51
TSH	3.79	3.53, 0.39	3.03 – 4.52

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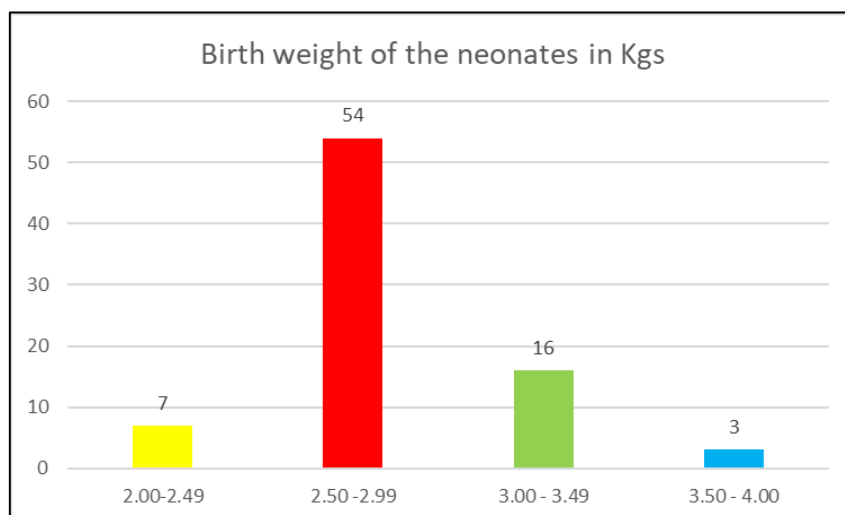


Figure 1: Graphical representation of the birthweight of the babies

Table 3: Prevalence of hypothyroidism in neonates born to mothers with hypothyroidism

Total Number of Neonates	Number with Hypothyroidism	Percentage	95% C. I
80	2	2.5	-0.92 – 5.92

Table 4: Association between birthweight of the baby and certain factors

Variable	Classification of variable (number of people in the group out of 80)	Number of subjects who had babies with birthweight less than 3 kgs (out of 61)	Odds ratio (95% C. I of odds ratio)	Chi – square value	P – value
Gender	Male (39)	32	1.89 (0.66-5.45)	1.41	0.23
	Female (41)	29	1.00		
Mode of birth	Vaginal (8)	7	2.33 (0.27-20.28)	0.12	0.73
	C- section (72)	54	1.00		

DISCUSSION

The thyroid gland is the largest single organ in the body specialized for endocrine hormone production. Its function is to secrete an appropriate amount of thyroid hormone, Tetra (T₄) & Tri iodothyronine (T₃). Iodine is trapped by thyroid and produce thyroglobulin and converted to tri iodo & di iodo thyroxine. Coupling with thyroglobulin occurs. Block in the synthesis at any level will lead to congenital hypothyroidism. In Primary Hypothyroidism T₄ decreases and high TSH is seen. Secondary Hypothyroidism free T₄ is decreased and low TSH. TSH is secreted by hypothalamus and regulated by thyrotrophic hormone. There is physiological surge in TSH in the first 48 hours of life because of cooling, cord clamping and stress of birth. Hence screening using either cord blood or heel prick after 72 hours of life should be

done to avoid false positive results. Maternal thyroxine may mask the clinical features of hypothyroidism in neonates. Hence it is mandatory to screen all neonates for congenital hypothyroidism as it is a preventable cause of mental retardation . Since the screening test is a sensitive test primary TSH approach is followed in our country. Maternal antibodies and iodine can cross the placenta and block neonatal thyroid function. Hence watch the babies for transient hypothyroidism. Only 0.25% of T₄ and 0.35% of T₃ are free. Hence free T₃ hormone concentration correlates with the thyroid state.

Levothyroxine is the treatment of choice 10-15 µg / kg /day as the initial dose given as single dose in the morning crushed and mixed with breastmilk or water. Neonatal hypothyroidism if not treated immediately it will produce irreversible injury. The incidence is higher in

asian individuals & lower in blacks. The incidence is greater in females than males. Down syndrome babies are at risk. 85% of cases are due to thyroid dysgenesis and 15% are due to dysmorphogenesis. Thyroid radionucleotide uptake & scanning are the most accurate imaging tests to define the size and location of any thyroid tissue. Family hypothyroidism, mother or close relatives taking thyroid tablets, undergone thyroid surgery or physical signs & symptoms of hypothyroidism should be evaluated by paediatrics & endocrinologist definitive ones are increased TSH and decreased T₄ levels.

OBSERVATION

On analysis of 100 cases 90% of the deliveries were caesarian section, 10% was vaginal delivery. That is due to mainly because of large babies. Regarding sex distribution males 49% and females 51%. Almost no gender difference, it was very marginal. Birth weight was more than 3 kg in 76% and less than 3 kg in 24%. Only 2 neonates were found to be in hypothyroid state. Male:Female 1:1

RESULTS

During the followup, monitor growth & development, compliance, symptoms, free T₄ & TSH. Thyroid hormone enhances the growth with growth hormone. Increased BMR, increased heart rate, decreased cholesterol level and maintaining thermogenesis. Hence children with hypothyroidism have poor growth, hypothermia, lethargy and bradycardia.

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