

A Comparative Study of Total Bilirubin, Thyroxine and TSH Levels in Newborn

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ABSTRACT

The present study was designed to investigate a relationship between total bilirubin levels, Thyroxine and TSH in newborn. Based on the bilirubin levels the study group were grouped as group I and group II. Thyroxine, TSH and total bilirubin of 70 newborn were estimated. The mean serum levels of Total bilirubin, TSH and T4 in group I were 4.7076 ± 1.91 mg/dl, 4.44 ± 2.62 mIU/ml and 1.64 ± 0.41 ng/dl respectively. The mean serum level of total bilirubin, TSH and Thyroxine in Group II were 11.5 ± 2.3 mg/dl, 4.68 ± 3.08 mIU/ml, 1.66 ± 0.51 ng/dl. The P value of group I bilirubin with TSH was 0.0001 and P value of group I bilirubin with Thyroxine was 0.09. P value of group I TSH with group II TSH was 0.02. According to the results of this study there is significant correlation between total bilirubin levels, Thyroxine and TSH in newborn.

Keywords: Thyroid stimulating hormone (TSH), Thyroxine, Total bilirubin

INTRODUCTION

In the first week of life Jaundice is one of the clinical signs which is most frequently detected. Hyperbilirubinemia plays an important role in the development of jaundice in 30-50% of term infants and in 80% of pre-term infants. ^(1,2) Due to insufficient production of thyroid hormones, hypothyroidism results. As a result of congenital hypothyroidism there is a delay in the maturation of hepatic Uridine Diphosphate Glucuronyl Transferase (UDPGT) which results in prolonged conjugated hyperbilirubinemia. ⁽³⁾

Approximately 10% of newborns are seen with hypothyroidism. Due to deficiency in UDGPT activity there is physiological jaundice in newborn. The UDGPT activity increases steadily reaching adult values in 14 weeks. ^(4,5)

The present study has been designed to investigate the relationship between neonatal total bilirubin levels, Thyroxine and TSH in the blood Samples.

MATERIAL AND METHODS

The study is conducted in department of biochemistry, Meenakshi medical college & hospital Kanchipuram after obtaining the institutional ethical committee clearance. 70 Newborns with signs of hyperbilirubinemia were screened for thyroxine, TSH and Total bilirubin levels.

Total bilirubin levels were estimated in BS 400 by Grot Jendrassik method. Thyroxine and TSH were measured in chemiluminescence method. Comparison of the levels of bilirubin with Thyroxine and TSH were performed in SPSS V.16. Obtained data were presented as mean, standard deviation (SD). Correlation between total bilirubin and thyroid hormone levels was computed by the Pearson's correlation coefficient. $P < 0.05$ was considered as significant.

INCLUSION CRITERIA

Newborn babies of full term gestation with normal weight.

EXCLUSION CRITERIA

Newborns with maternal history of thyroid disorders and thyroid supplements, preterm infants were excluded in this study.

RESULTS

Total bilirubin levels, serum TSH and Thyroxine were measured. The bilirubin levels were grouped as Group I (0-8 mg/dl) and Group II (8-16mg/dl)

Table 1: Mean and standard deviation of Group-I Bilirubin, TSH and Thyroxine

	Mean	Standard deviation
Bilirubin	4.70	1.91
TSH	4.44	2.62
T4	1.64	0.41

Table 2: Mean and standard deviation of Group-II Bilirubin, TSH and Thyroxine

	Mean	Standard deviation
Bilirubin	11.50	2.30
TSH	4.68	3.08
T4	1.66	0.51

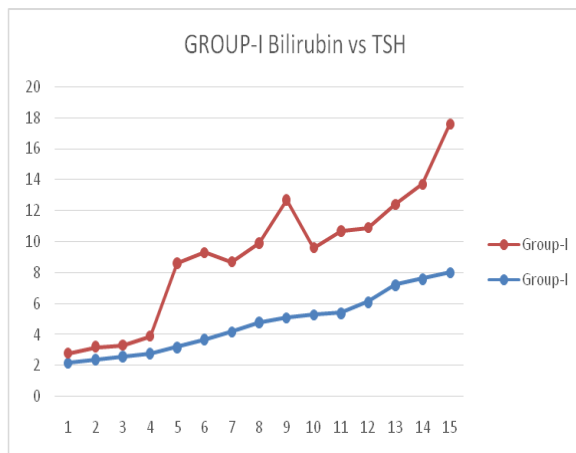


Figure 1. COMPARISON OF GROUP-I BILIRUBIN LEVELS (0-8 mg/dl) vs TSH
P-Value of group-I bilirubin with TSH was 0.0001.

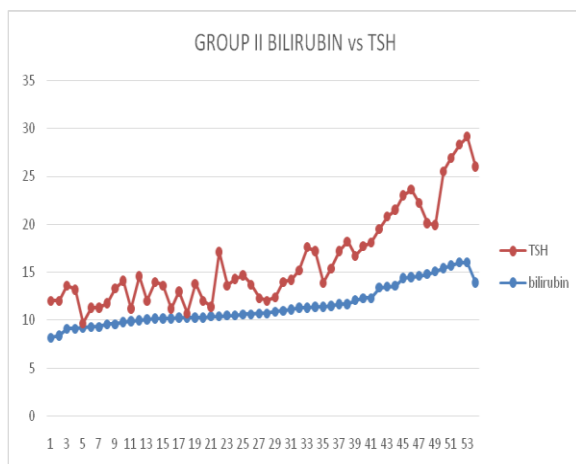


Figure 2. COMPARISON OF GROUP-II BILIRUBIN LEVELS (8-16 mg/dl) Vs TSH
P-Value of group-II bilirubin with TSH was 7.8

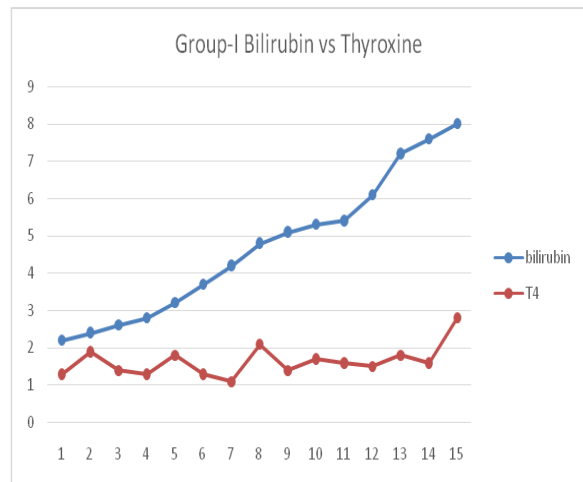


Figure 3. COMPARISON OF GROUP-I BILIRUBIN LEVELS (0-8 mg/dl) vs T4
P-Value of group-I bilirubin with Thyroxine was 0.09

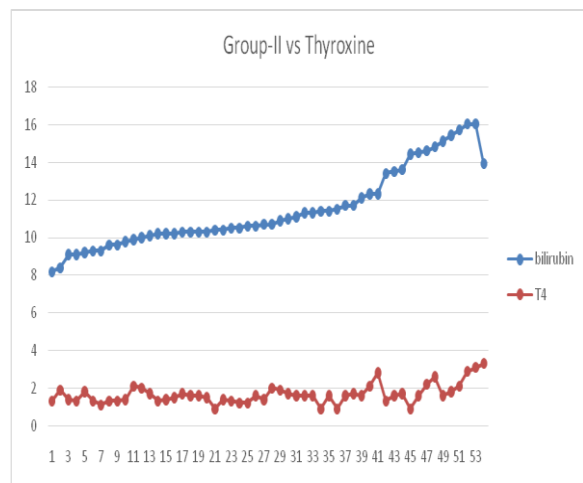


Figure 4. COMPARISON OF GROUP-II BILIRUBIN LEVELS (8 - 16mg/dl) vs Thyroxine
P-Value of group-II bilirubin with Thyroxine was 0.0001.

The mean serum level of group I bilirubin levels (0-8mg/dl) was 4.70 ± 1.91 mg/dl. The mean serum level of group II bilirubin levels (8-16mg/dl) was 11.5 ± 2.3 mg/dl. The mean serum level of TSH in Group I was 4.44 ± 2.62 mg/dl. The mean serum level of Thyroxine in group I was 1.64 ± 0.41 mg/dl. The mean serum level of TSH in Group II was 4.68 ± 3.08 mg/dl. The mean value of Thyroxine in Group II was 1.66 ± 0.51 mg/dl.

DISCUSSION

In the first week of life hyperbilirubinemia is one of the causes for readmission of neonates to hospital. Congenital hypothyroidism is sometimes associated with delayed maturation of

hepatic uridine diphosphate glucuronyl transferase enzyme activity. (3,6)

Based on the recommendations of American Academy of Pediatrics (AAP) predischage Total Serum Bilirubin (TcB) measurements and /or assessment of clinical risk factors should be carried out for every newborn before discharge.

In the present study there is significant correlation between Total bilirubin and TSH in group I and between Total bilirubin and Thyroxine in group II which was similar with the previous studies conducted. (7,8)

CONCLUSION

The results obtained from the present study suggest that simultaneous measurement of Total bilirubin, Thyroxine and TSH can be useful for screening congenital hypothyroidism.

Jaundice which results from thyroid hormones levels as in congenital hypothyroidism depend on the degree and duration and can affect bilirubin metabolism

To establish the correlation of Total bilirubin levels with Thyroxine and TSH in the first few days of hypothalamic-pituitary-thyroid axis maturation further studies with sample size is required as this period is being very dynamic and influenced by several factors.

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