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Short Report

Serum thyroid function tests in neonates of mothers with thyroid disease

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ABSTRACT

Maternal thyroid disease can affect the newborn baby leading to neonatal hyperthyroidism or hypothyroidism. Babies born to mothers with thyroid disease get thyroid function tests (TFT) done randomly irrespective of the nature of maternal thyroid disease and medication. The aim of this study was to determine which babies are at-risk and need thyroid function monitoring besides a simple Guthrie screening test and to produce a local guideline for management of this particular cohort of babies. This prospective study done on 30 newborn babies concluded that simple Guthrie screening test is enough to monitor majority of these babies. A new local guideline is formulated accordingly.

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1. Introduction

In a busy neonatal unit the attending Clinician frequently comes across neonates born to mothers with thyroid problems and needs to evaluate the thyroid status of these babies. In doing so it was noticed in the unit that these babies had thyroid function tests done at various age group ranging from day one to day twenty and even some of them had it done multiple times as the initial results were abnormal. These babies also had universal Guthrie screening test in 2nd week of their life. It is known that thyroid function tests done in 1st week of the life often reflect maternal disease status and not neonatal disease[1]. Thus this study was done to determine the best method to monitor these babies and rationalise the need for thyroid function tests there by saving time, money and avoiding anxiety to parents.

2. Methods

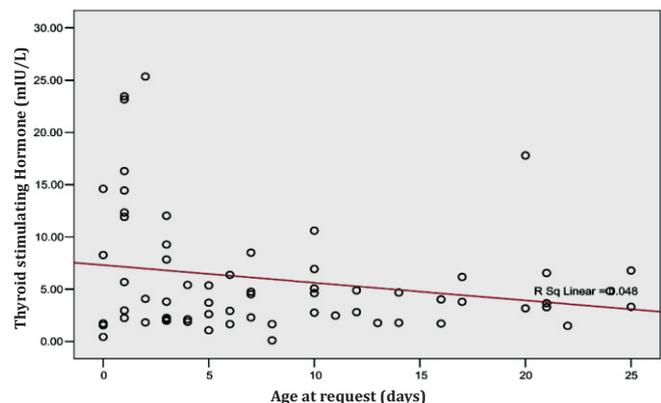
Prospective study conducted during January 2009 to march 2010. Notes of all babies born to mothers with thyroid disease during this period were reviewed and 30 eligible neonates recruited for the study. The nature and treatment of maternal thyroid disease, clinical condition of the babies, number of serum samples taken from each baby, the age of the baby when these tests were done and the individual results were recorded. Guthrie screening test results for these babies were obtained and compared with that of serum thyroid function tests. The results were classified as normal and abnormal. When there were multiple blood samples taken from the same baby, the Guthrie test was compared to the baby's last serum sample, as this is the one, which offered the best correlation to the baby's outcome.

A proforma was filled for every individual baby. The results were analysed on an SPSS V13 Program.

3. Results

30 babies were born to mothers with thyroid disease. Hashimoto's thyroiditis was the main maternal problem followed by Graves' disease. 65 samples measuring serum thyroid function were taken from these 30 babies. Some babies had multiple samples (ranging from 2 to 4) taken from them. These samples were taken at varying time intervals (day 1 to day 25 of lie). Most repeat blood tests were done in the first week of life. Trend towards normalising thyroid functions were noted after 7 days of life (Figure 1). Despite the initial abnormal serum thyroid function in some babies, all the Guthrie screening test results done in 2nd week of life were normal.

Figure 1. Serum result vs Age of test (all samples N=65)



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4. Discussion

Neonatal hyperthyroidism is usually caused by transplacental passage of thyroid stimulating immunoglobulin (TSIs) from mothers with Graves' disease or Hashimoto's thyroiditis[2]. Maternal hypothyroidism is usually due to Hashimoto's thyroiditis(auto-immune) and the mother may be producing thyroid inhibiting or rarely thyroid stimulating antibodies, so the baby may develop transient hypothyroidism or very rarely hyperthyroidism. If maternal hypothyroidism is due to congenital aplasia or hypoplasia of the thyroid gland, there is only a slightly increased risk of the baby developing hypothyroidism [2,3].

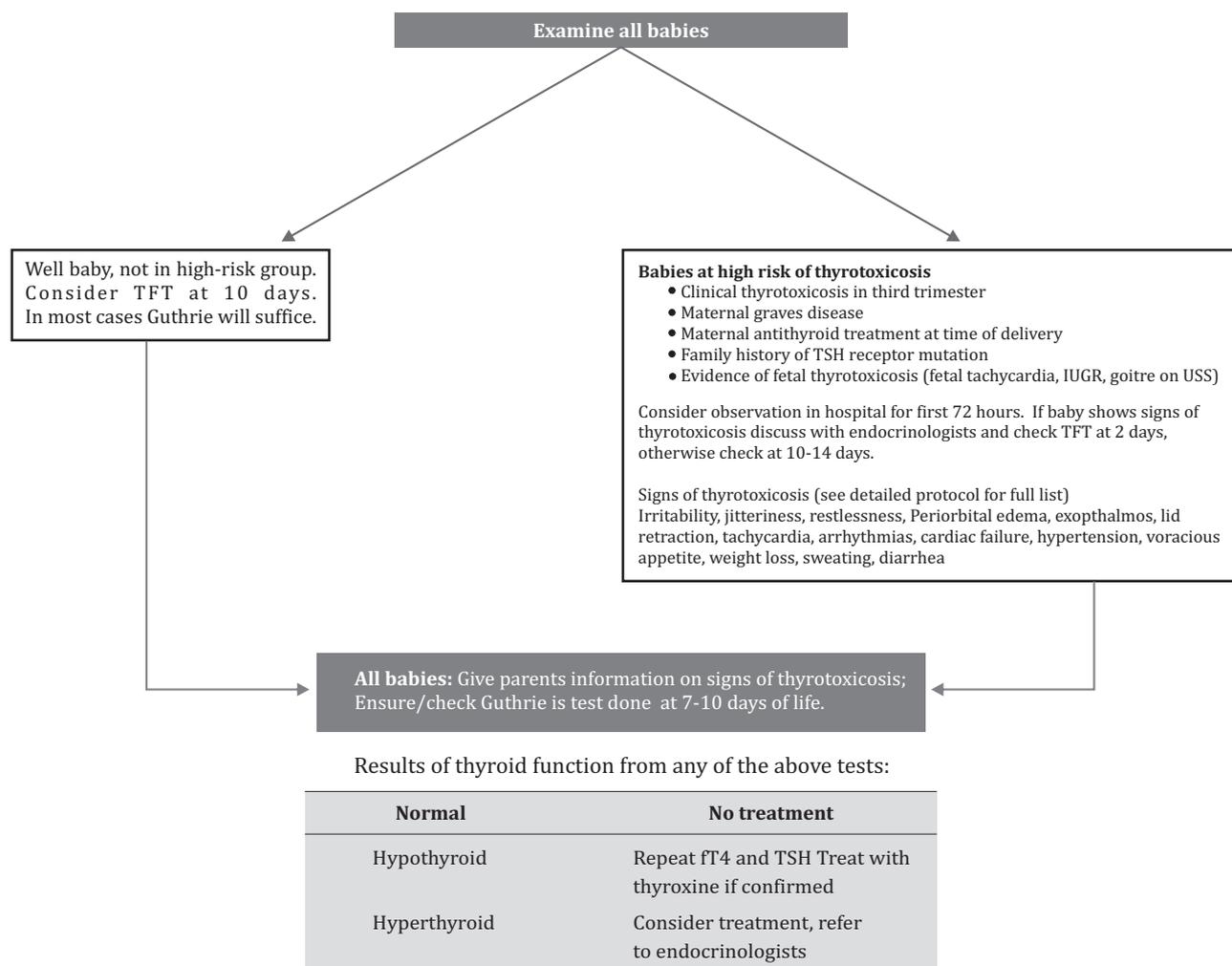
The study showed that serum thyroid function tests (65 samples from 30 babies) were generally abnormal (TSH>5 mIU/L) and thus not interpretable if done early (less than 6 days of life). Serum thyroid function tests tended to normalise spontaneously to within accepted reference ranges in the second week of life. Guthrie screening tests were normal in all the babies including those who had abnormal serum thyroid function tests in first week of their life. These two observations suggest that indiscriminate.

serum thyroid function tests in first week of life in low risk babies are counterproductive as abnormal results prompt repeat tests and unnecessary anxiety to parents and clinician. On follow up all the babies were euthyroid with a normal clinical outcome.

5. Conclusion

Tough this study includes babies born to mothers with various thyroid disorders, babies themselves are either at risk of developing hypothyroidism or hyperthyroidism. The guideline (Table 1) Provide an approach to evaluation of these babies. Only the babies who are at risk of developing hyperthyroidism may need thyroid function tests in first week of life. Clinical monitoring and Guthrie tests may be enough to monitor low risk babies. This study is an effort made to rationalise Serum thyroid function tests in babies born to mothers with various disorders and to discourage the practise of ordering indiscriminate thyroid function tests. Recommendations from this study are limited by small number of the study group and hence more studies of this nature are needed. It is also worth to include free T4 levels along with TSH levels to evaluate the results of such studies.

Table 1. Suggested Guide for Investigation of Babies of Mothers with Thyroid Disease



What is already known?

Maternal thyroid problems can affect the newborn baby and can lead to neonatal hyperthyroidism or hypothyroidism. TSH levels vary significantly in the postnatal period and the cut off used for predicting hypothyroidism vary from region to region

What this Study Adds

The Guthrie screening test along with clinical examination is enough to detect problem in neonates born to mothers with thyroid problems. Serum thyroid function tests in first week of life are rarely recommended. In addition, the guideline describes an at-risk population of babies requiring earlier thyroid function testing.

Contribution of each author

MKB: Concept, planning and conduct of the study. Manuscript preparation and literature searching, preparation of primary draft, statistical analysis, and will act as guarantor of the study. FM: literature searching, Critical revision and supervision of manuscript. The final manuscript was approved by both authors.

Declaration on competing interests

No conflict of interest.

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6. References

- [1] Oglivy-Stuart AL. Neonatal thyroid disorders. Arch Dis Child. Fetal Neonatal Ed. 2002; 87: F165-171.
- [2] Peleg D, Cada S, Peleg A, Ben-Ami M. The relationship between maternal serum thyroid-stimulating immunoglobulin and fetal and neonatal thyrotoxicosis. Obstet Gynecol. 2002; 99:1040-1043.
- [3] Habeb AM, Zubier M, Piraudeau P, Mathew V. Do we need to assess the thyroid function in the infants of mothers with Hashimoto's thyroiditis? Arch Dis Child Fetal Neonatal Ed. 2003; 88: F258.