Neonatal thyrotoxicosis and craniosynostosis associated with maternal Graves' disease and high dose maternal thyroxine therapy for papillary carcinoma P1-P929

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Introduction

- Neonatal Graves disease (NGD) occurs in 1-2% of newborns of women with Graves disease, from trans-placental passage of maternal antibodies (1).
- Thyroid auto-antibodies can persist in the maternal circulation, even 10 years after thyroidectomy (2).
- During pregnancy, both maternal TSH-stimulating auto-antibodies and high dose thyroxine can cross the placenta, and cause craniosynostosis in the baby (3).
- We report an infant with neonatal Graves disease and craniosynostosis
- The mother had undergone total thyroidectomy for medically uncontrolled Graves' disease prior to the pregnancy, and was high dose thyroxine therapy throughout pregnancy

Figure 1
Mother and child, aged 9 months

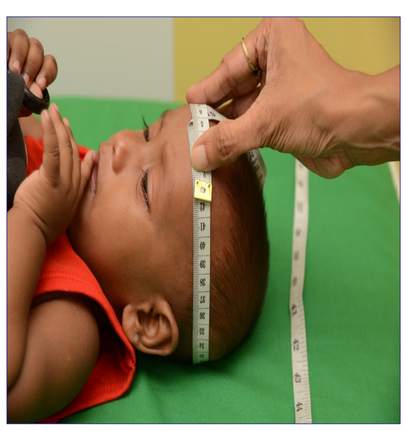


Figure 2- Microcephaly

Case History

Baby boy

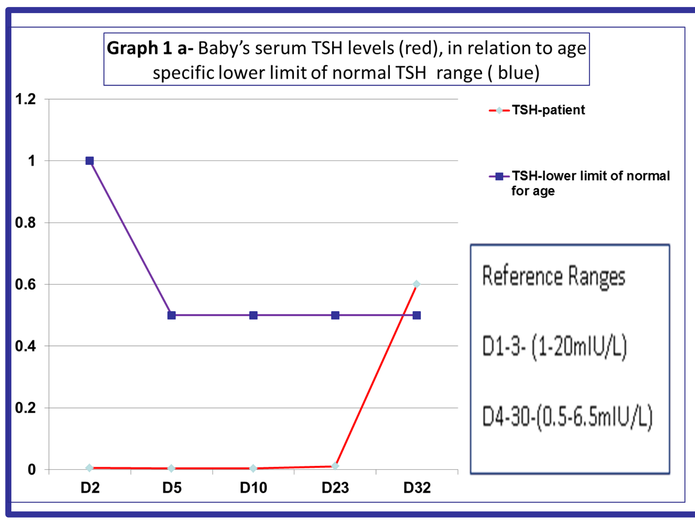
- Delivered at 32 weeks of gestation by emergency caesarean section due to fetal distress
- Respiratory distress and tachycardia from birth, no goitre
- Baby's thyroid functions assessed on day 2: normal fT4 [4.6 ng/dl (2-5)], low TSH [0.005 mIU/L (1-20) *(Graph 1 a)*
- On day 5, baby developed diarrhoea, high blood pressure and proptosis
- Serum fT4 elevated [5.4 ng/dl (normal range 0.9-2.2)] *(Graph 1 b)*

Mother

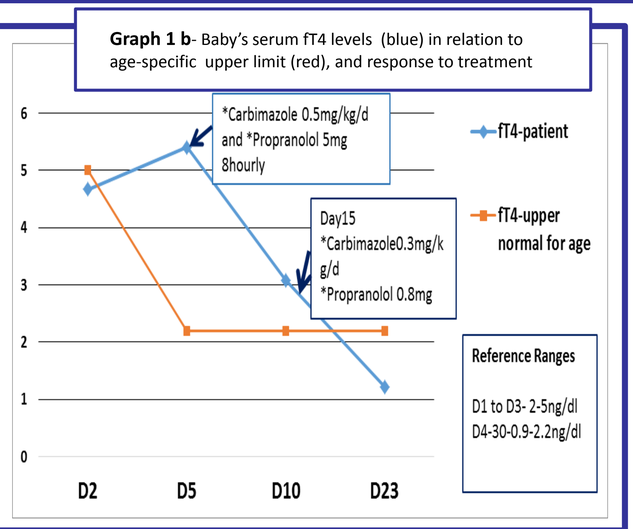
- 33 year old, with past history of Graves disease a few years prior to pregnancy, with poor control medically
- Total thyroidectomy done, few months prior to conception
- Micropapillary thyroid carcinoma detected on routine histology
- Commenced on oral thyroxine 200 μg/d by oncologist to suppress TSH
- Unplanned pregnancy, thyroxine continued throughout pregnancy by mother
- Maternal thyoxine and thyroid auto antibody levels not monitored in pregnancy
- Very infrequent antenatal clinic attendance
- Bilateral exophthalmos, and thyroidectomy scar on examination

Management

Graph 1 a- Baby's serum TSH levels (red), in relation to age specific lower limit of normal TSH range (blue)



Graph 1 b- Baby's serum fT4 levels (blue) in relation to age-specific upper limit (red), and response to treatment



- Baby commenced on carbimazole and propranolol on day 5
- Gradual clinical improvement & normalization of ft4 *(Graph1 b)*
- Thyroid functions monitored regularly
- Carbimazole gradually tapered off over 3 months

At follow up at 9 months of age *(figure 1)*

- Microcephaly *(figure 2)* with mild developmental delay
- Completely fused anterior fontanel with radiological evidence of premature suture fusion

Conclusions

- Both **fetal/neonatal hyperthyroidism** from maternal stimulating antibodies and high dose **maternal thyroxine** therapy could have contributed to **craniosynostosis /microcephaly** in this baby
- It is important to **be vigilant** of past maternal autoimmune thyroid disease during pregnancy, and **monitor** the fetus and new-born accordingly, as persisting maternal antibodies can cause neonatal thyroid problems
- **Young females** with thyroid disease should be educated on the **importance** of obtaining medical advice and monitoring their thyroid functions **pre-conceptionally** and during **pregnancy**, and informing the neonatal team at delivery, to monitor the **newborn** as necessary

References

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Disclosure- the authors have no potential conflicts of interest to declare