Introduction

- We present a five year old girl with thyroid hormone resistance, subsequently discovered to be heterozygous for TRbeta mutation.
- This case highlights the necessity to investigate, in detail, all children with persistently high thyroxin with normal TSH levels in order to aid future management and the necessity to follow them up.

Case Report

Birth: Normal delivery, weighing 3.34kg (50th centile)

6 months old: Referred for poor weight gain (2nd centile)
  - Blood tests = Elevated free T4 (43.4) with normal TSH (3.10)
  - Systemic examination was normal and remained so over the following months
  - Repeat thyroid function tests showed persistently elevated T4 with normal TSH

2 ½ years old: Genetic analysis revealed heterozygosity for TRbeta mutation
  - Mum has no mutation detected and SDs father cannot be tested for unavoidable reason

Since then...
- Slow growth
- Idiopathic thrombocytopenic purpura
- Vitamin D deficiency
- Coeliac disease

Broader antibody testing has not revealed an underlying autoimmune aetiology to date

Recently:
- Gross motor skills generally delayed
- Investigated for recurrent falls and abnormal gait:
  - Winged scapulae
  - Prominent Abdomen
  - Right sided hemi hypotrophy with drooped shoulder and pelvis as well as flared ribs

TR-beta mutation

- Resistance to thyroid hormone action is due to mutations in the beta-isoform of the thyroid hormone receptor.
- Patients display inappropriate central secretion of Thyroid hormone from the hypothalamus and of TSH from the anterior pituitary. This is despite elevated levels of thyroid hormone (T4 and T3).
- Mutation of the beta thyroid hormone receptor is usually either autosomal dominantly inherited or is a de novo mutation, resulting in defective patterns of gene expression.
- This is a rare disorder, usually presenting with goitre.

Conclusion

- TRbeta mutation should be considered in children with persistently elevated T4 levels with a normal TSH.
- Other immune conditions like ITP and changes in body habitus are new associations, cause of which is yet not identified.