Long term anti-thyroid drug therapy in a paediatric population with Down Syndrome: an Irish experience

N Johnston[1], M Mavinkurve[1], N Murphy[1]
[1]Department of Endocrinology, Children's University Hospital, Temple Street, Dublin 1

Introduction

Ireland has the highest prevalence of Down syndrome (DS) in Europe, affecting approximately 1 in 500 live births. (1) Patients with DS are at higher risk of developing thyroid disorders during childhood. (2)

Hyperthyroidism can be difficult to diagnose and treat in this population.

First-line therapy with anti-thyroid drugs (ATDs) may help achieve remission, but relapse is common following discontinuation of medication(3). Definitive treatment with radioablation or surgery is often considered but may have additional risks in the DS population.

Treatment options in hyperthyroidism

Treatment	Advantages	Disadvantages
Antithyroid medications	Often first-line option	High relapse rate Compliance issues Minor side effects Rare but serious drug reactions
Radioablation	Definitive Suitable for those unable to take medication	Radiation exposure Iatrogenic hypothyroidism Worsening eye disease Practical difficult es (need to avoid contact with young children)
Surgery	Definitive Suitable for those with large goiters Suitable for those with eye disease	Increased anaesthetic risk in DS population with significant co-morbidities Surgical complications Iatrogenic hypothyroidism

Methods

Five children with DS had hyperthyroidism confirmed at our centre. Information regarding clinical features at presentation, diagnostic testing and management with antithyroid drugs was recorded

Presentation and diagnostic testing

5 children (2 females and 3 males) had a mean age of 5.5 years (range 3.7 to 8.0 years) at diagnosis. The most common presenting features are see below. Of note, no children had significant thyroid eye disease.

Diagnostic testing confirmed an increased free thyroxine level (FT4, mean 36.4pmol/L, range 25.9-49.4pmol/l), increased free triiodothyronine level (FT3, mean 7.3nmol/L, range 3.6-14.7nmol/L), suppressed thyroid stimulating hormone level (TSH, mean <0.01mIU/L, range 0.05-5 mIU/L). Anti-thyroid peroxidase (TPO) and TSH receptor antibody (TRAB) titres were positive in all cases.

Presenting feature	Prevalence
Tachyardia	80%
Goitre	60%
Excessive sweating	60%
Behavioural change	40%
Weight loss	20%
Diarrhea	20%

Treatment and follow up

All children were treated with anti-thyroid drugs for a mean of 2.6 year (range 0.5 years to 4.5 years)

Carbimazole was the agent of choice and was commenced at a dose of 0.25mg/kg three times daily, and titrated to achieve biochemical euthyroid state.

There were no serious drug reactions or compliance issues reported, despite prolonged use. Two of five children had mild self limiting rashes noted early in the course of treatment which resolved with emollients.

At most recent follow up, all children remained clinically and biochemically euthyroid on ATDs and none have proceeded to definitive therapy. TRAB antibodies have persisted to date and given high risk of relapse, our patients have not yet undergone a trial off anti-thyroid medications.

Conclusion

- Patients with DS are at increased risk of developing thyroid disorders during childhood
- Hyperthyroidism may be difficult to recognise and treat in this population.
- Anti-thyroid drugs should be considered a safe and effective option for long-term management of hyperthyroidism in the DS population, and may be preferable to definitive treatments.

References

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