Thyroid disorder among people with
DOWN'S SYNDROME

DOWN'S SYNDROME ASSOCIATION MEDICAL SERIES

Notes for doctors

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DOWN'S SYNDROME ASSOCIATION
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Thyroid disorder

Thyroid disorder is more frequent at all ages among people with Down's syndrome than among the non-Down's syndrome population. Around 15% of adolescents with Down's syndrome have hypothyroidism, and there is evidence for a steady decline in thyroid function as age increases (Pueschel et al. 1991). Congenital hypothyroidism is also over-represented (Cutler et al. 1986). The aetiology is heterogeneous and not fully understood but an auto-immune type thyroiditis is often causative.

Thyroid antibodies are found in around 30% of people with Down's syndrome and have been detected in children with the syndrome as early as age 2 years old. The presence of antibodies does not necessarily imply thyroid dysfunction but should be taken as an indication to check thyroxine levels frequently. The absence of antibodies does not preclude hypothyroidism from other causes.

Some young children with Down's syndrome have raised TSH levels which subsequently normalise (Cutler et al. 1986; Selikowitz 1993, Gibson et al 2005). Raised TSH alone does not therefore necessarily predict incipient hypothyroidism. However, those with raised TSH levels should be kept under close surveillance. Sharav et al. (1988) found evidence of additional growth retardation among under 4s with raised TSH levels, but this was not confirmed by Selikowitz (1993).

Diagnosis
of a thyroid disorder

Hypothyroidism

Hypothyroidism can be difficult or even impossible to diagnose on clinical grounds in a person with Down's syndrome because of major overlap of symptoms with normal features of the syndrome (Prasher 1995). One USA study showed 20% of community based patients had previously undetected hypothyroidism (Friedman et al. 1989). As in the general population, onset of thyroid deficiency is usually insidious. Unexpected physical or affective change or functional deterioration at any age is an indication for thyroid function tests. It is particularly important to differentiate hypothyroidism from depression and/or dementia (Prasher and Krishnan 1993).

Hyperthyroidism, though much less frequent, is also over-represented among the population with Down's syndrome (Takahasi et al. 1979).

In view of the difficulties of clinical diagnosis there is a need for a high index of clinical suspicion for thyroid dysfunction among those with Down's syndrome and for biochemical screening protocols to be followed.

Biochemical screening

There is a lack of reliable information about the natural history of the development of thyroid disorder in people with Down's syndrome and the effectiveness of different screening protocols.

However, on the basis of the best evidence available the current recommendation of the UK Down's Syndrome Medical Interest Group is as follows: **At a minimum, every child should have either:**

- **a venous blood sample to check T4, TSH, and thyroid antibodies at age 1 and thereafter 2 yearly for life or:**
- **fingerprick dried blood spot TSH measurement annually, followed by venous blood testing for other parameters only if TSH raised.**

The less invasive fingerprick testing will not necessarily pick up hyperthyroidism, but this condition should be clinically obvious. The procedure may be more acceptable to many people with Down's syndrome. It reduces the need for venous sampling, and increases the screening frequency (Noble et al. 2000).

For further information, *"How to arrange a fingerprick blood test"*, see **www.dsmig.org.uk**.

Treatment
of a thyroid disorder

Thyroxine

Thyroxine replacement therapy, when indicated, should be instituted and monitored as in the general population.

There are occasional reports of adverse behavioural sequelae at the onset of treatment. If this occurs, the dose should be increased in smaller increments and, if necessary, over a longer time scale.

Tirosh et al found no evidence of any advantage conferred by thyroxine replacement therapy for those with low-borderline thyroid function (Tirosh et al. 1989).

More recently van Trotsenburg (2005) has treated a group of babies with Down's syndrome from birth with thyroxine but found only minimal advantage at age 2.

Treatment can have a dramatic effect on quality of life when frank hypothyroidism is present, but we do not consider there is evidence to support the use of thyroxine in any other circumstance.

Clinical Pointers

Increased prevalence of hypothyroidism at all ages, rising with age

- Small increase in hyperthyroidism
- Clinical diagnosis unreliable
- Biochemical screening protocols essential
  - venous protocol at age 1 and 2 yearly for life or
  - annual fingerprick screen if available
- Young children may have transitory high TSH without hypothyroidism
- Thyroxine treatment only indicated if hypothyroidism is biochemically confirmed
- Treatment as for general population.

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Evidence based information for health care professionals about thyroid dysfunction in Down's syndrome is available on www.dsmig.org.uk

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