Society for Endocrinology - Media Release

Embargoed until 00.01 GMT, Tuesday 16 March 2010

New research shows it may be safe for patients taking thyroxine to have lower TSH levels than currently recommended

New research shows that it may be safe for patients taking thyroxine replacement to have low but not suppressed thyroid stimulating hormone (TSH) levels. The research, presented at the Society for Endocrinology BES meeting in Manchester, shows for the first time that it may be safe for patients to take slightly higher doses of thyroxine than are currently recommended.

The thyroid gland produces hormones that regulate metabolism, in particular a hormone called thyroxine. Hypothyroidism occurs when the thyroid gland produces too little thyroxine. This condition affects approximately 3% of the UK population and is easily treated through taking daily doses of thyroxine hormone replacement. When treating hypothyroidism, clinicians aim to ensure that levels of another hormone called TSH also remains in the normal range. TSH stimulates the thyroid gland to release thyroxine. Its levels are controlled by thyroxine in a negative feedback loop, with greater levels of thyroxine leading to a decreased TSH production. There have been concerns that abnormal TSH levels can be bad for health and lead to a greater risk of a number of conditions, such as heart disease and osteoporosis.

Dr Graham Leese, from Ninewells Hospital and Medical School, led a research team examining patients on thyroxine replacement therapy. They studied how variations in these patients' TSH levels affected their long-term health. The study followed 16,426 patients taking thyroxine (86% female, mean age 60 years) and examined how their risk of contracting a range of diseases varied with their TSH levels.

The study found that patients with very high (>4.0mU/l) or suppressed (≤0.03mU/l) TSH levels more frequently suffered from heart disease, abnormal heartbeat patterns and bone fractures compared to patients whose TSH levels are in the normal range (0.4-4.0 mU/l). Patients who had a slightly low TSH level (0.04-0.4mU/l) did not have an increased risk of contracting any of these conditions.

These results show for the first time that it may be safe for patients taking long-term thyroxine replacement therapy to have a low but not suppressed TSH level. These patients do not show an increased risk of suffering from heart disease, bone fractures or abnormal heartbeat patterns. This means that patients may be able to take slightly higher doses of thyroxine than are currently recommended without having an adverse effect on their health.

Researcher Dr Graham Leese, a Consultant at NHS Tayside and Honorary Reader in Diabetes and Endocrinology at the University of Dundee, said:

"This is the first population-based study to show that having slightly lower TSH levels when taking thyroxine replacement is not detrimental to health. We found that having high or suppressed levels of TSH did lead to a higher risk of heart disease and bone fractures and so it is important that we continue to monitor TSH levels carefully to ensure that neither of these situations happen.

"Prescribing thyroid hormone replacement therapy is a careful balancing act as doctors need to ensure that the levels of a number of hormones all remain with the normal range after treatment. Our findings mean that it may be safe for patients with hypothyroidism to take marginally higher doses of thyroxine than are currently recommended. However careful monitoring of these patients would still required. We now need other studies to confirm our findings before any changes are made to routine clinical care."

----------Ends----------

Notes for editors

This research will be presented as an oral presentation (OC5.6) at the Society for Endocrinology BES meeting at 17:15, Tuesday 16 March 2010. The abstract for this work is reproduced at: http://www.endocrine-abstracts.org/ea/0021/ea0021OC5.6.htm.

The Society for Endocrinology BES 2010 conference is Britain's biggest scientific meeting on hormones, and is taking place at the Manchester Central Convention Complex from 15-18 March 2010. For the full programme, please see http://www.endocrinology.org/meetings/2010/sfebes2010/.

Please mention the Society for Endocrinology BES meeting in any story

For more information: please contact the Society for Endocrinology press office

Jennie Evans
Public & Media Relations Officer
Mob: +44(0)7773 797 501
Tel: +44(0)1454 642 230
Email: jennie.evans@endocrinology.org

Toby Stead
Public & Media Relations Assistant
Mob: +44 (0)7531 945 676
Tel: +44 (0)1454 642 252
Email: toby.stead@endocrinology.org

The Society for Endocrinology is Britain's national organisation promoting endocrinology and hormone awareness. For general information, please visit our website: http://www.endocrinology.org
The Society for Endocrinology in association with the Royal College of Physicians and a number of other Societies recently released a statement on the correct treatment of hypothyroidism. This can be downloaded here.

Patient Support Group
The British Thyroid Foundation is a patient-led charitable organisation dedicated to raising awareness and helping people with thyroid disorders. Website: www.btf-thyroid.org

ABSTRACT

Is it safe for patients taking thyroxine to have a low but not suppressed serum TSH concentration?

Graham Leese & Robert Flynn
University of Dundee, Tayside, UK.

For patients taking thyroxine replacement guidelines generally recommend aiming for a target TSH within the laboratory reference range. The evidence for this guidance is generally based on an extrapolation of data from patients with endogenous subclinical thyroid disease. We aimed to examine the safety of having a TSH which was either suppressed (≤0.03 mU/l), low (0.04–0.4 mU/l), 'normal' (0.4–4.0 mU/l) or raised (>4.0 mU/l) in a population-based cohort of patients all of whom were treated with thyroxine.

We used a population-based thyroid register (TEARS) linked to outcomes data from hospitalisation records, death certification data and other datasets between 1993 and 2001. The endpoints of cardiovascular disease, dysrhythmias and fractures were assessed. Patients were categorised, using a time weighted mean of all TSH recordings.

There were a total of 16 426 patients on thyroxine replacement (86% female, mean age 60 years) with a total follow-up of 74 586 years. Cardiovascular disease, dysrhythmias and fractures were increased in patients with a high TSH (adjusted hazards ratio 1.95 (1.73–2.21), 1.80 (1.33–2.44) and 1.83 (1.41–2.37) respectively), and patients with a suppressed TSH (1.37 (1.17–1.6), 1.6 (1.1–2.33) and 2.02 (1.55–2.62) respectively), when compared to patients with a TSH in the laboratory reference range. Patients with a low TSH did not have an increased risk of any of these outcomes (HR: 1.1 (0.99–1.123), 1.13 (0.88–1.47) and 1.13 (0.92–1.39) respectively.

People on long-term thyroxine with a high or suppressed TSH are at increased risk of cardiovascular disease, dysrhythmias and fractures. People with a low but not suppressed TSH did not have an increased risk of these outcomes in this study. It may be safe for patients treated with thyroxine to have a low but not suppressed serum TSH concentration.