

Synthetic or a Natural Thyroid Replacement: Should the Choice be Left to the Patient?

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Editorial

Data from National Health and Nutrition Examination Survey (NHANES 1999-2002) reveals 3.7% prevalence of hypothyroidism in the general population [1]. 10.3 million People or 4.6% of those surveyed reported use of thyroid hormones (levothyroxine, liothyronine, or desiccated thyroid) [1]. Desiccated Thyroid Extract (DTE) of animal origin has been used to treat hypothyroidism since 1892 [2,3]. Several authors have previously raised questions about standardization of levothyroxine (T4) and L-triiodothyronine (T3) in thyroid extract [3]. The switch to a more expensive synthetic preparation, sodium L-thyroxine, had been advocated in the 1960's [4].

Synthetic levothyroxine has replaced desiccated thyroid extract for the treatment of hypothyroidism and is recommended as monotherapy by the 2012 joint guidelines of the American Association of Clinical Endocrinologists (AACE) and the American Thyroid Association (ATA) [5]. However up to 15% of patients on levothyroxine do not feel as well despite adequate dose monitoring and normalization of TSH, T4 and T3 levels, reporting lower sense of psychological well-being [6-9]. One of the proposed explanations for the impaired neurocognitive function in patients on levothyroxine despite achieving biochemical euthyroidism is a defect in thyroid hormone transport or metabolism [7]. However, multiple clinical trials failed to demonstrate an advantage of levothyroxine and L-triiodothyronine combination therapy for improvement of neurocognitive symptoms [5,7]. Almost half of the patients expressed preference for DTE over levothyroxine in a randomized, double-blind, crossover study in a tertiary care center [6]. Statistically significant improvement in subjective symptoms among these patients while treated with DTE was measured by the general health questionnaire-12 and thyroid symptoms questionnaire [6].

Manufacturing and standardization process of DTE has improved over the years [6]. Desiccated bovine and porcine thyroid were found to be effective for the treatment of hypothyroidism in a small clinical study, with no statistical difference in thyroid function tests or serum lipids between groups [10].

Synthetic levothyroxine has been prescribed for treatment of hypothyroidism for decades; however some patients continue to search for alternative treatments for their symptoms, often finding mislabeled and unregulated thyroid preparations on shelves of health- food stores [3,11,12].

In a large cross-population study in the Netherlands, health-related quality of life was not found to be associated with abnormal thyroid function, contrary to prior studies, and researchers own expectations [13]. However, the results of a large community-based British study demonstrated statistically significant difference of psychological sense

of well-being reported by patients on levothyroxine with normal TSH compared to controls of similar age and sex and suggests that more questions remain to be answered [9].

The association of genetic polymorphisms of deiodinases and thyroid hormone transporters and individual responses to thyroid replacement therapy has been recently proposed and should be further investigated [7]. More randomized clinical studies are needed to evaluate cognitive function and mood in patients treated with synthetic levothyroxine as compared with DTE.

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