

## **Association of Clinical and Behavioural Factors with Oral Levothyroxine (LT-4) Dose of Primary Hypothyroid Patients in Sri Lanka: A Matched Case Control Study**

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Hypothyroidism is a prevalent endocrine disorder that requires treatment with levothyroxine (LT-4). Levothyroxine dose is typically ranging from 1.5-1.7 µg/kg/day to achieve a serum thyroid stimulating hormone (TSH) level of 0.4-4.0 mIU/L (reference range). Once the LT-4 dose is adjusted to obtain the target TSH level, it remains stable in most patients. However, around 10% of the patients require unusually high doses of LT-4 and frequent dose adjustments. This study aimed to determine the association of clinical and behavioural factors with the oral levothyroxine dose requirement of primary hypothyroid patients in Sri Lanka. The study was conducted as a matched case-control study, recruiting primary hypothyroid patients (18-65 years) who visit the diabetes and endocrinology clinic at the National Hospital, Kandy, Sri Lanka. The cases were defined as the patients receiving an LT-4 dose > 1.7 µg/kg/day and controls as the patients receiving an LT-4 dose ≤ 1.7 µg/kg/day with normal TSH, for the preceding three months. A total of 95 cases and 95 controls who are matched in terms of age, sex and Body Mass Index (BMI) were recruited. An interviewer-administered questionnaire was used to collect data from the participants (n = 190). Data was analysed using the SPSS software. The age group 42-52 years consisted of the majority of hypothyroid patients (31.6%), and the female individuals were more prone to primary hypothyroidism than males (92.6%). There was no statistically significant association of family history, patient compliance (assessed using Medication Adherence Report Scale (MARS-5), ©Professor Rob Horne), and medication storage conditions with LT-4 dose requirement (p > 0.05). Notably, there was a significant association of the intake of iron supplements (OR = 0.081 (95% confidence intervals (95% CI), 0.10 - 0.64), frequent intake of gastrointestinal medicines (OR= 3.8 (95% CI, 1.55-9.50) and iodine rich food (OR = 2.9 (95% CI, 1.21-6.97) with LT-4 dose requirement (p < 0.05). This study concludes that dietary habits, gastrointestinal medicines such as proton pump inhibitors and iron supplement intake should be considered when optimizing the levothyroxine dose and patient awareness should also be improved. Furthermore, additional research and genetic studies are recommended in this field in Sri Lanka, as genetic variations may significantly influence thyroid homeostasis.

**Keywords:** Hypothyroidism, levothyroxine, dose requirement, factors

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