

The absorption of liquid levo-thyroxine is not significantly impaired by food intake

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Levo-thyroxine (L-T4) is one of the most commonly administered drugs in the world. It may be employed as a replacement therapy in the patients with either congenital or acquired hypothyroidism and may also be used, in TSH-suppressive doses, in subjects with goiter or non-toxic thyroid nodules.

Unfortunately, the compliance of patients with respect to this treatment is often compromised by the usual recommendation of ingesting the daily L-T4 dose thirty minutes before breakfast or at bedtime, at least three hours after the evening meal (1). In fact, it is well known that an empty stomach represents a very important condition for the optimal intestinal absorption of L-T4, due to the blunting effect of both meals and even some beverages on its absorption (2, 3).

The recent advent on the Italian market of a novel L-T4 formulation (Tirosint oral drops, solution; IBSA Farmaceutici, Italia) has prompted some investigations aiming to compare the clinical effects of liquid L-T4 formulation with those recorded in the patients treated with the classic tablet preparation. These recent studies have taken into consideration both children (4,5) and adults (6).

According to the report by Peroni et al (5), the liquid preparation could improve the rapidity of thyroid status normalization after treatment onset, perhaps as a consequence of a faster absorption (5). This inference has been, just recently, supported by the results of a prospective investigation, which demonstrated that liquid L-T4 is more effective than L-T4 tablets in controlling TSH levels in hypothyroid patients without malabsorption, gastric disorders or drug interference (7).

Moreover, another very important study by Cappelli et al (8) has recently shown that the absorption of liquid L-T4 is not significantly impaired by food intake (8), as against as generally observed for tablet preparation (2, 3).

Finally, in the context of these studies aiming to analyze the potential advantages of L-T4 drops versus tablets, the report by Marina et al (6), included in the present issue of Acta Biomedica, assumes a supreme importance, since it reinforces the concept that liquid L-T4 taken at breakfast may represent a valuable alternative to other forms of L-T4 therapy. In fact, the serum FT4 percentage increase after L-T4 intake was found to be comparable in the patients taking liquid formulation while fasting (6). These results clearly suggest that the daily L-T4 dose has not to be necessarily ingested in fasting conditions, provided that liquid L-T4 formulation is employed.

On the basis of such results, it is possible to predict that the traditional compliance problems with L-T4 therapy might be, in the future, definitively surmounted with a larger use of liquid L-T4 formulation. Furthermore, it has to be considered that the administration of drops to newborns and infants is easier than tablets, which have to be crushed and dissolved in water before administration. However, correct information by pediatricians and particular attention by parents should be provided, in order to limit dosing mistakes caused by miscounting drops (5).

Another important issue which has to be commented regarding liquid L-T4 preparation is the presence of ethanol as an excipient. Nevertheless, according to the statements of the American Academy

of Pediatrics, the risk threshold for ethanol in blood is 150 mg/kg body weight (9). To achieve this risk threshold when taking L-T4 liquid preparation, a dose four times the maximal therapeutic dose should be ingested by children (5), which is sufficiently reassuring about this risk.

To sum up, the analysis of the most recent studies suggests that L-T4 liquid formulation is efficacious and safe, both in adults and in children (4-8), although careful monitoring to limit overtreatment risks is needed when using L-T4 drops in children (5).

Finally, an important advantage of liquid L-T4 preparation is the potential improvement of compliance with this chronic treatment. Such an advantage is particularly important for the infants with congenital hypothyroidism (10). In these cases, in fact, the optimization of replacement therapy is known to have positive long-term repercussions (10) in terms of psychomotor and cognitive development, sensorineural hearing function (11), growth (12) and bone maturation (13). Furthermore, liquid L-T4 formulation, thanks to its more rapid absorption, might allow an earlier discrimination between transient and permanent congenital hypothyroidism (14).

List of abbreviations:

L-T4: levo-thyroxine

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