

LT4 absorption test in 14-year-old patient with severe refractory hypothyroidism after total thyroidectomy

Gaia Vincenzi¹, Marina Di Stefano¹, Marco Abbate¹, Giulia Tarantola¹, Graziano Barera¹, Maria Cristina Vigone¹
¹ Vita-Salute San Raffaele University, Pediatric Department San Raffaele Hospital, Milan, Italy

Hypothyroid patients post thyroidectomy require 1.6-1.8 mcg/kg/die of Levothyroxine (L-T4). A persistent TSH level above the upper limit despite a daily dose >1.9 mcg/kg/die is defined as “refractory” hypothyroidism in adults. Malabsorption and “pseudo-malabsorption” need to be investigated in case of therapeutic failure. The L-T4 absorption test (LT4AT) is useful in distinguishing these two conditions but it has only been described in adult age.

<i>At diagnosis</i>	TSH (mcu/mL)	FT3 (pg/mL)	FT4 (ng/dL)		TSH (mcu/mL)	FT3 (pg/mL)	FT4 (ng/dL)	Therapy
10 years old	<0.01	10	> 6	Start Methimazole (0.5 mg/kg/day)	After 12 months	<0.01	4.7	MMZ 0.20 mg/kg/day
					After 15 months	0.01	4.1	MMZ 0.4 mg/kg/day + LT4 1.2 mcg/kg/day

AbTG, AbTPO: positive – TRAB >40 U/L (nv < 0.55)

- ✓ Referred adequate compliance
- ✓ Nutritional indices: within limits
- ✓ Screening for celiac disease: negative

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	TSH (mcu/mL)	FT4 (ng/dL)	Therapy (mcg/kg/day)
<i>After 6-12 months</i>	25.9	0.8	LT4 1.91 → 2.33
	34	0.9	LT4 2.45 → 2.9
	24.5	1.07	LT4 2.9 → 3.46
	122	0.59	LT4 4.07

12 years old: **TOTAL THYROIDECTOMY**
(! Transient hypocalcemia)
Start LT4 1.5 mcg/kg/die
→ Thyroid function within limits in the first months

Admission in the pediatric department

LT4 ABSORPTION TEST (LT4 1000 mcg):

	1° day	5° day	0	1° hour	2° hour	3° hour	4° hour	6° hour	24° hour	After 7 days
TSH (mcu/mL)	217	96.6	43.5	38.3	34.8	28.3	31.5	29	15.3	4.72
FT4 (ng/dL)	0.27	1.22	1.44	2.46	3.04	3.12	3.14	3.25	2.84	1.74
FT3 (pg/mL)	/	/	2.58	2.75	2.82	3.03	3.07	2.92	3.25	3.45

	TSH (mcu/mL)	FT4 (ng/dL)	Therapy (mcg/kg/day)
<i>After 15 days</i>	0.18	3.74	LT4 3.91 → 2.34
<i>After 30 days</i>	0.10	2.31	LT4 2.21 → 1.84
<i>After 45 days</i>	0.2	2.1	LT4 1.84 → 1.47
<i>Last evaluation</i>	4.7	1.6	LT4 1.5



A possible non-adherence to L-T4 therapy must be investigated while managing refractory hypothyroidism and LT4 absorption test could provide valuable informations also in adolescence.

- Bibliography:
1. Ghosh et al. Levothyroxine Absorption Test to Differentiate Pseudomalabsorption from True Malabsorption. Eur Thyroid J. 2020 Jan;9(1):19-24
 2. Elbasan et al. Refractory hypothyroidism to levothyroxine treatment: five cases of pseudomalabsorption. Acta endocrinol (buchar). 2020 jul-sep;16(3):339-345
 3. Miccoli et al. Levothyroxine Therapy in Thyroidectomized Patients. Front Endocrinol (Lausanne). 2021 Jan 29;11:626268