



Serum fibroblast growth factor 21 (FGF-21) levels of children and adolescents with Hashimoto's thyroiditis, before and after L-thyroxin medication

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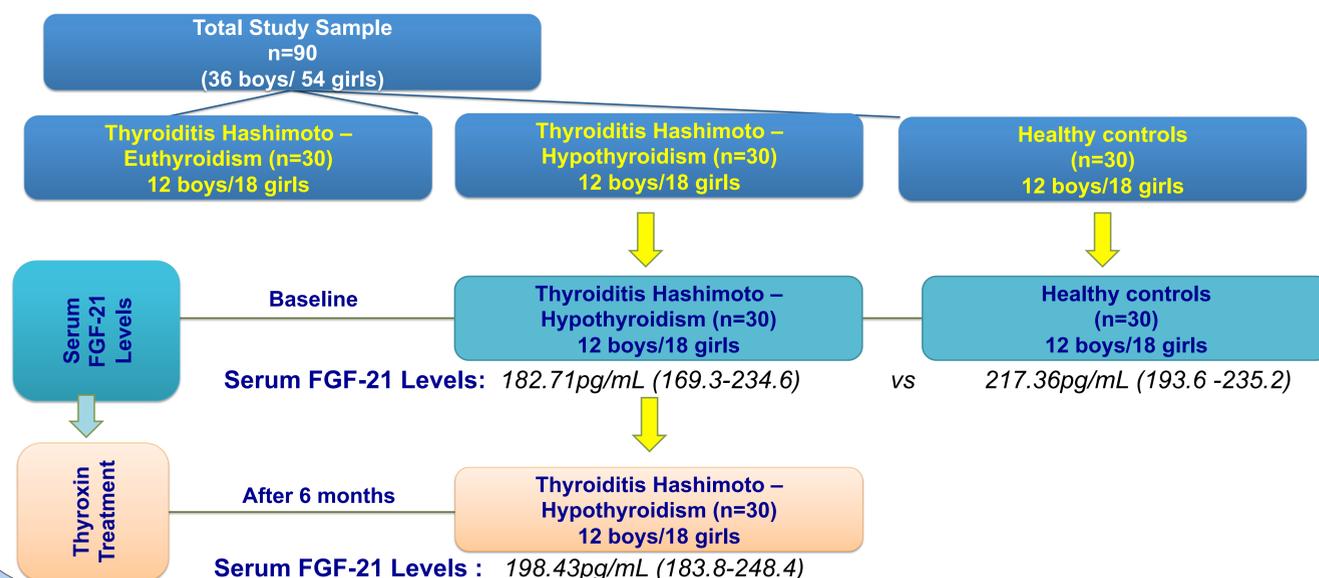
Background

- Fibroblast growth factor 21 (FGF-21) is a complex molecule involved in energy, lipid and glucose metabolism, sharing biochemical pathways and sites of action with thyroid hormones.
- FGF-21 is synthesized and acts primarily on the liver, but weaker expression has also been described in muscle, pancreas and adipose tissue.
- FGF-21 acts through both endocrine and paracrine mechanisms, regulating different metabolic pathways like fatty acid oxidation, glucose uptake and thermogenesis
- Recent animal and human studies have highlighted a close bidirectional relationship between FGF-21 and THs, which is partially elucidated.
- The aim of the present study was to investigate possible associations among FGF-21 levels, resting metabolic rate (RMR), lipidemic profile and L-thyroxin replacement therapy treatment in children and adolescents with Hashimoto's thyroiditis and hypothyroidism.

Methods

- Sixty children and adolescents (age range 5-18 year old), with newly diagnosed Hashimoto's thyroiditis (30 in hypothyroidism, 30 in euthyroidism) and 30 age and gender matched healthy participants (control group) were enrolled.
- Biochemical parameters, Resting Metabolic Rate (RMR) and serum FGF-21 levels were assessed in all participants.
- Participants with Hashimoto's thyroiditis and hypothyroidism were thereafter administered L-thyroxin replacement therapy. Six months after initiation of L-thyroxin medication, serum FGF-21 levels were re-evaluated.

Results



- At baseline, serum FGF-21 levels were measured lower in the hypothyroidism group compared to the control group, but this difference was not statistically significant [182.71pg/mL (169.3-234.6) vs 217.36pg/mL (193.6-235.2), $p=0.717$].
- Despite the increase in serum FGF-21 levels after 6 months of L-thyroxin treatment, this augmentation did not reach significance [198.43pg/mL (183.8-248.4) vs 182.71pg/mL(169.3-234.6) $p=0.734$].
- Free thyroxin levels correlated positively to FGF-21 levels in both the total study population ($r=0.399$, $p<0.01$) and in the group with hypothyroidism at baseline-before treatment ($r=0.385$, $p<0.05$).
- Participants with hypothyroidism and euthyroidism presented elevated triglyceride levels ($p<0.05$).
- L-thyroxin treatment had no impact on RMR, lipid concentrations or glycemic parameters.
- An increase in fat mass and free fat mass was reported in the hypothyroidism group after L-thyroxin administration, independently of serum FGF-21 levels.

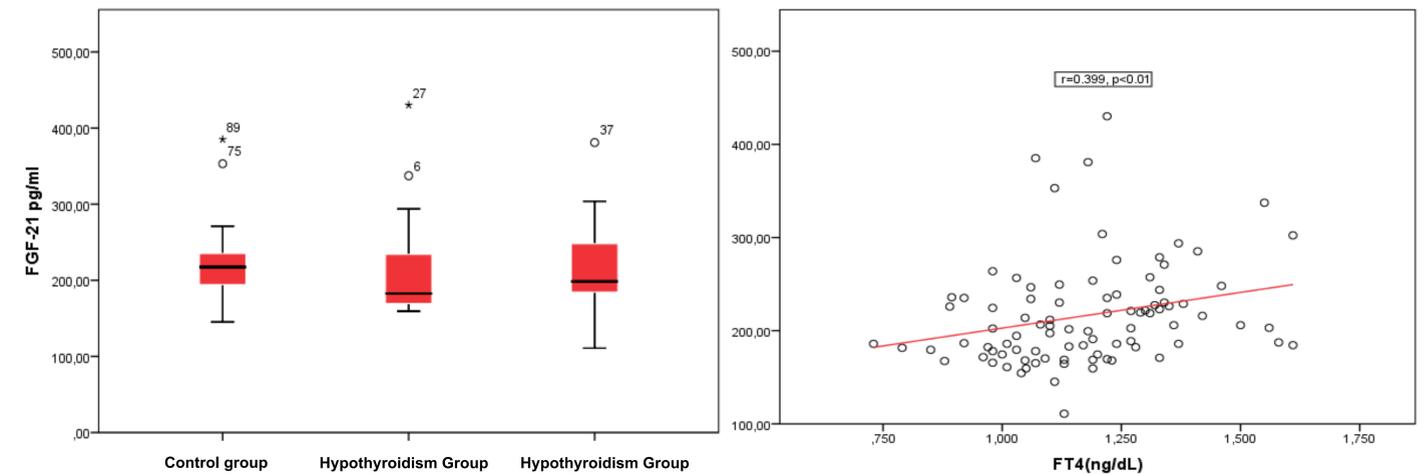


Figure 1. Serum levels of FGF-21 among different study groups.

Figure 2. Correlation graph between serum FGF-21 and ft4 levels.

Conclusion

- In the present novel study of FGF21 levels in youngsters with hypothyroidism due to thyroiditis Hashimoto, serum FGF21 levels are measured lower than in healthy individuals and increased after treatment with L-thyroxin, although without statistical significance.
- Further studies with a large number of young patients with severe hypothyroidism due to Hashimoto's thyroiditis are needed to confirm the association between FGF-21 levels and thyroid function.

References

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