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# The Relation Between Epicardial Fat Tissue and TSH Receptor Antibody in Hyperthyroidism

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## Abstract

The pathogenesis of association between hyperthyroidism and atherosclerosis is not well known. TSH receptor antibody (TRAb) is responsible for increased fat tissue in graves ophthalmopathy. Epicardial fat tissue thickness (EFT) has been shown to increase in case of overt hyperthyroidism. In our study, we aimed to investigate the relationship between EFT and TRAb in newly diagnosed hyperthyroidism.

Twenty six TRAb positive (group 1), 26 TRAb negative (due to thyroiditis, toxic adenoma or gravese) (group 2) newly diagnosed patients in outpatient clinic of Harran University were enrolled. EFT was measured by the same cradiologist using an echocardiography device. Serum TRAb levelss were measured by the 'Radio Receptor Assay' method and levels above 1.75 IU/L were considered as positive.

There was no difference between groups in terms of age, gender and body mass index. Although there was no significant difference between group 1 and 2, mean EFT was significantly higher in groups 1 (0.38±0.15 cm) and 2 (0.4±0.17 cm) compared to group 3 (0.25±0.06 cm) (p=0.003 between group 1 and 3. p=0.001 between group 2 and 3). Furthermore. there was no significant correlation between TRAb levels and EFT.

Several studies showed that hyperthyroidism has been associated with cardiovascular disease and mortality. Also the EFT has been found to be related with cardiovascular disease and mortality. TSH receptors and proteins have detected in orbital fibroblasts and adipose tissues and TSH receptors have been found to be associated with adipogenesis in Graves ophthalmopathy. Stimulation of endogenous adipogenesis in orbital preadipocytes with dealing of TRAb has been showed. The results of our study suggest that increase in EFT independent the presence of TRAb, it directly depends on the cardiovascular effects of hyperthyroidism. The change EFT with the correction of hyperthyroidism by treatment mus t be investigated.

Table 1. Comparison of clinical laboratory parameters in groups.

| Parameter | Group 1 (n=26) | Group 2 (n=26) | Group 3 (n=26) | p |
|---|---|---|---|---|
| Age (year) | 39.1±11.4 | 38.7±13.9 | 39.1±11.4 | NS |
| Gender (female/male) | 17/9 | 17/9 | 17/9 | NS |
| BMI (kg/m$^2$) | 25.8±4.5 | 26.1±4.7 | 25.8±4.5 | NS |
| TSH (mIU/L) | 0.007±0.004 | 0.01±0.007 | 1.7±0.9 | NS |
| sT4 (ng/dL) | 3.4±1.9 | 2.7±1.7 | - | NS |
| sT3 (pg/mL) | 11.4±5.5 | 6.9 ±3.6 | - | <0.001 |
| TRAb (IU/L) | 9.6±6.8 | 0.59±0.42 | - | <0.001 |
| EFT (cm) | 0.38±0.15* | 0.40±0.17+ | 0.25±0.06 | <0.001 |

*: between group 1 and group 3 p=0.003
+: between group 2 and group 3 p= 0.001
Abbreviations: BMI: body mass index, EFT: epicardial fat tissue thickness, fT3: free triiodothyronine, fT4: free thyroxin, TRAb: TSH receptor antibody, TSH: thyroid stimulant hormone.

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