

IL-2, IL-4, IL-5, IFN- γ and TNF- α Levels in Turkish Patients with Hashimoto's Thyroiditis

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OBJECTIVES

Hashimoto's Thyroiditis (HT) is one of the most common autoimmune thyroiditis that characterized by lymphocytic infiltration and thyroid hormonal disturbances. Genetic and environmental factors play a role in etiology of the disease, but genetic factors are most common. In this study, we investigated the association between Hashimoto's thyroiditis and IL-2, IL-4, IL-5, TNF- α and IFN- γ levels.

METHODS

We performed a case-control study that included 139 cases with HT (50 euthyroid, 50 subclinical hypothyroid, 39 overt hypothyroid patients) and 50 healthy control. Subjects were collected from Endocrinology Clinic of Pamukkale University in Turkey. Serum levels of IL-4, IL-5, TNF- α , IFN- γ were measured. HT cases were classified into three subgroups according to their thyroid function status: Euthyroid patients (Group-1) subclinical hypothyroid patients (group-2) Evident hypothyroid patients (Group-3).

Table 1. Laboratory results of HT and control groups.

	Hashimoto thyroiditis	Control	P
Age (years)	39.02 ± 9.88	35.02 ± 10.96	0.019*
Glucose (mg/dl)	95.38 ± 9.88	91.78 ± 1.01	0.036*
Insulin (μ U/ml)	10.79 ± 5.80	11.21 ± 1.15	0.730
HOMA-IR	2.60 ± 1.72	2.49 ± 0.26	0.415
IL-2 (pg/ml)	60.14 ± 30.87	45.79 ± 3.75	0.005*
IL-4 (pg/ml)	27.39 ± 39.95	20.54 ± 1.81	0.016*
IL-5 (pg/ml)	16.22 ± 34.02	15.62 ± 1.93	0.211
TNF- α (pg/ml)	41.92 ± 85.09	39.11 ± 8.63	0.001*
IFN- γ (pg/ml)	46.05 ± 40.49	47.89 ± 1.23	<0.001*

Table 2. Euthyroid, subclinical hypothyroid, evident hypothyroid and control group's laboratory results

	Euthyroid HT (Group-1)	Subclinical HT (Group-2)	Evident HT (Group-3)	Control	P
Age (years)	39,7 ± 10,9	37,22 ± 9,49	40,72 ± 10,95	35,02 ± 10,96	0,053*
Glucose(mg/dl)	96,02 ± 1,47	96,08 ± 1,36	92,84 ± 1,51	91,78 ± 1,01	0,044*
Insulin (μ U/ml)	10,41 ± 0,82	10,52 ± 0,64	11,27 ± 1,15	11,21 ± 1,15	0,948
HOMA-IR	2,67 ± 0,29	2,48 ± 0,17	2,54 ± 0,26	2,49 ± 0,26	0,794
IL-2 (pg/ml)	67,28 ± 3,97	47,35 ± 5,15	69,79 ± 3,01	45,79 ± 3,75	<0,001*
IL-4 (pg/ml)	17,78 ± 1,73	27,80 ± 2,58	39,04 ± 11,62	20,54 ± 1,81	<0,001*
IL-5 (pg/ml)	12,99 ± 0,59	18,84 ± 7,76	16,80 ± 1,82	15,62 ± 1,93	0,001*
TNF- α (pg/ml)	23,25 ± 2,31	49,06 ± 9,96	57,20 ± 22,74	39,11 ± 8,63	0,001*
IFN- γ (pg/ml)	44,02 ± 9,39	52,92 ± 2,85	39,34 ± 1,47	47,89 ± 1,23	<0,001*

RESULTS

IL-2, IL-4, TNF- α and IFN- γ levels were significantly higher in Hashimoto's thyroiditis patients (Table 1). IL-2 levels were higher in group 3, IL-4 and TNF- α levels were also significantly higher in group 3. (Table-2) There were no significant differences in IL-5 levels between Hashimoto's thyroiditis and control groups. (Table-1) (Table-2)

CONCLUSIONS

Because of the genetic defect of the suppressor T cells, damage of the cellular immunity occur in HT. Due to defect, suppressor T cells cannot suppress the helper T cells. Activated helper T lymphocytes stimulate B lymphocytes and numerous cytokines such as IFN- γ . Activated CD4+, CD8+ T lymphocytes, B lymphocytes, plasma cells and macrophages cause an inflammatory response at the thyroid gland (1,2). Cytokines play a central role in the pathogenesis of HT. Studies showed that Inflammatory cytokines such as IFN- γ TNF- α , TGF- β , IL-1, IL-6, and IL-8 play important role in thyrocyte destruction. IL-2, IL-4, TNF- α and IFN- γ levels were significantly higher in Hashimoto's thyroiditis patients(3). Our study support these findings.

References

1. Tomer Y, Barbesino G, Greenberg DA, et al. Mapping the major susceptibility loci for familial Graves' and Hashimoto's diseases: evidence for genetic heterogeneity and gene interactions. *J Clin Endocrinol Metab* 1999; 84:4656.
2. Chistiakov DA. Immunogenetics of Hashimoto's thyroiditis. *J Autoimmune Dis* 2005; 2: 1.
3. Lorini R, Gastaldi R, Traggiai C, Perucchin PP, Hashimoto's Thyroiditis. *Pediatr Endocrinol Rev* 2003; 1 Suppl 2: 205- 11.

