

# Elevated TSH (in upper limit of normal) and insulin resistance

Boz M, Muderrisoglu C, Altunoglu E, Akbas F, Erdenen F, Polat H  
Istanbul Training and Research Hospital, Clinics of Internal Medicine.

## Objectives:

Level of TSH respond to fluctuations in serum free (FT<sub>4</sub>) but remain in a very narrow individual range. Thyroid function tests are intrinsically linked to variables of insulin resistance and endothelial function. It is possible that underlying factors lead simultaneously to increased serum TSH, insulin resistance, even within current normal TSH levels.

## Methods:

We aimed to investigate the patients with upper limit of TSH and insulin resistance in patients of our out-patients clinics of endocrinology where they were addressed for obesity. Serum insulin, C-peptide and TSH Levels were measured by chemiluminescence method on Advia Centour XP and HbA<sub>1c</sub> measured by immune – inhibition on Advia 2400 chemistry system (Siemens Healthcare Diagnostics Inc).

Table: Comparison of the parameters of two groups (mean ±SD)

	TSH <4 µU/ml	TSH ≥4 µU/ml	p
Age (years)	49.16±15.03	51.34±14.37	n.s.
Systolic blood pressure (mm Hg)	127.72±19.20	128.97±19.29	n.s.
Diastolic blood pressure (mm Hg)	78.13±8.82	78.45±13.18	n.s.
Fasting blood glucose (mg/dl)	111.15±53.15	105.28±32.58	n.s.
HbA <sub>1c</sub> (%) 5.74±1.35	5.78±1.44	5.57±0.90	n.s.
Insulin (µU/ml)	10.92±7.45	17.84±20.75	0.004
C-peptide (ng/ml)	2.88±1.49	3.76±2.36	0.016
FT <sub>4</sub> (ng/ml)	1.30±0.33	1.20±0.86	n.s.
Weight (kg)	84.96±19.35	83.25±16.63	n.s.
BMI (kg/m <sup>2</sup> )	32.38±7.90	31.81±5.81	n.s.
Waist circumference (cm)	99.65±16.81	96.04±14.04	n.s.
WHR (waist/hip ratio)	0.87±0.07	0.84±0.05	0.046

## Results:

Some characteristics of study group (means ±SD) (totaly 152 patients): Age (years):49.7±14.8, Systolic blood pressure (mm Hg):128.8 ± 19.2, Diastolic blood pressure (mm Hg): 78.3±9.6, Fasting bood glucose (mg/dl): 110.3±48, HbA<sub>1c</sub> (%): 5.74±1.35, insulin (µU/ml): 12.2±11.4, C-peptide (ng/ml):3.04±1.71, TSH (µIU/ml):2.56±2.7, FT<sub>4</sub> (ng/ml): 1.28±0.47, Weight (kg):84.5±18.7, BMI (kg/m<sup>2</sup>):32.2±7.5, waist circumference (cm):98.9±16.3, WHR (waist/hip ratio): 0.87±0.07. When we divided into two group according to TSH levels (<4 or ≥4 µIU/ml), we found hyperinsulinemia (p<0.004), elevated C-peptide levels (p<0.01), and WHR (p<0.04) in the second group.

## Conclusions:

This findings could justify the increased risk for insulin resistance associated disorders, such as cardiovascular disease, observed in patients even with upper limits of TSH levels.

## References:

1. B UU, Mn S, Km S, Prashant A, Doddamani P, Sv S: Effect of insulin resistance in assessing the clinical outcome of clinical and subclinical hypothyroid patients. J Clin Diagn Res 2015; 9(2): OC01-4.
2. Vyakaranam S, Vanaparthy S, Nori S, Palarapu S, Bhongir AV: Study of Insulin Resistance in Subclinical Hypothyroidism. Int J Health Sci Res 2014; 4(9): 147-153.
3. Sridevi A, Vivekanand B, Giridhar G, Mythili A, Subrahmanyam KA: Insulin resistance and lipid alterations in subclinical hypothyroidism. Indian J Endocrinol Metab 2012; 16(Suppl 2): S345-6.

