

Thyroid Functions in Psychiatric Disorders: The Low TSH Levels in Unipolar Depressive Patients

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ÖZET

The Bu çalışma 92 psikiyatrik yatan hasta (39 şizofreni, 22 unipolar depressif ve 17 bipolar manik afektif bozukluk, 14 paranoid bozukluk) ve 54 sağlıklı kişide yapılmıştır. TSH seviyeleri unipolar gruba kıyasla şizofreniklerde anlamlı derecede yüksek bulunmuştur ($t=3.59$, $p<0.01$). Unipolar grup kontrollerle kıyaslandığı zaman TSH konsantrasyonları arasında istatistik anlamlılıkta bir farklılık ortaya çıkmıştır ($t=3.88$, $p<0.01$). Depressif bozukluklarda, düşük plazma TSH seviyesi artmış sirküle eden kortizolün supressif etkisine bağlı olabilir.

Anahtar kelimeler: Tiroid fonksiyonları, psikiyatrik bozukluklar

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SUMMARY

The study was carried out in 92 psychiatric inpatients (39 schizophrenia, 22 unipolar depressive and 17 bipolar manic affective disorders, 14 paranoid disorders) and 54 healthy subjects. TSH levels were significantly higher in schizophrenics than those in unipolar group ($t=3.59$, $p<0.01$). There was a statistically significant difference in TSH concentrations in unipolar group when compared to controls ($t=3.88$, $p<0.01$). Low plasma TSH level may be due to suppressive effect of increased circulating cortisol in depressive disorders.

Key words: Thyroid function, psychiatric disorders

INTRODUCTION

Trials in the 1920s and 1930s reported some benefit following administration of thyroid hormone to schizophrenic patients.

The release of TSH is regulated by thyroid-releasing hormone (TRH); both, appear to be inhibited by dopamine. A few trials treating schizophrenia with synthetic TRH have shown improvement, particularly in negative symptoms; benefit was even greater when the TRH was combined with a neuroleptic (1).

Thyroid function abnormalities may predispose individuals to develop depression (2-4) or other affective disorders (5). Gold et al found that 3 % - 5 % of depressed patients had elevated TSH concentrations (2,4).

On the other hand, there are controversial findings on this subject in the literature. Comparable decreases in plasma TSH have been reported previously (Golstein et al 1980, Kjellman et al 1984, Uden et al 1987) in patients with major depressive disorders (6-8). Banki et al (1985) found that baseline TSH was

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lower in depression than in schizophrenia, major depression, and alcohol dependence (9). Tollefson et al (1985) investigated any possible relation between thyroid function tests and clinical outcome of 40 major depressive patients and found that patients entering a depressive recurrence manifested lower free versus bound thyroxine quotients had higher TSH secretion (10). Loosen (1986) claimed that depression was the most frequently observed psychiatric symptom in patients suffering from hypothyroidism and that a small dose of thyroid hormone would accelerate the antidepressant effect of tricyclic antidepressants (11).

In the present study, we aimed to investigate the changes related to hypothalamo-hypophyseal axis by measuring serum TSH, T3, T4 levels in unipolar, bipolar (manic phase), paranoid and schizophrenic disorders.

MATERIALS and METHODS

In this study, 92 psychiatric inpatients (39 schizophrenia, 22 unipolar depressive and 17 bipolar manic affective disorders, 14 paranoid disorders) in Psychiatry Department, Atatürk University, Research Hospital between 1991-1993 years and 54 age matched healthy subjects were included.

Blood was obtained from patients between 8 AM and 10 AM one day following their admission to the hospital. There were 48 men and 44 women in patient group and 32 men and 22 women in control group. Patients were taking one or more of the following drugs: amitriptyline, imipramine, trazodon, haloperidol, lithium carbonate, thioridazine, mi-

anserine, trifluoperazine. Control subjects were healthy volunteers or blood donors age ranged between 19 and 55 years.

Serum T3, T4 were measured by radioimmunoassay kits (Diagnostic Products Corporation, Coat-A-Count, USA, cat. no: TKT41) and serum TSH was measured by and immunoradiometric assay (Diagnostic Products Corporation, IRMA-Count, USA, cat. no:RKTS1).

RESULTS

Serum levels of TSH, T3, and T4 in patient and control groups and statistical results are given in Table I. As shown from the table, TSH levels were significantly higher in schizophrenics than those in unipolar group ($t=3.59, p<0.01$). There was a statistically significant difference in TSH concentrations in unipolar group when compared to controls ($t=3.88, p<0.01$). In addition, marginally significant differences were detected in bipolar and paranoid groups when compared to controls ($t=1.45, 0.05<p<0.1$ and $t=2, 0.05<p<0.01$, respectively) (Figure 1).

There were not any significant differences in terms of T3 ve T4 serum concentrations in patients groups. However, there were week significant differences in T3 levels in unipolar, bipolar and paranoid disorders when compared to control group ($t=1.74, 0.05<p<0.1$; $t=1.49, 0.05<p<0.1$; $t=1.53, 0.05<p<0.01$, respectively).

DISCUSSION

In the treatment of mood disorders, the contribution

Table 1. Serum levels of TSH, T3, and T4 in patient and control groups and statistical results

| Groups | n | TSH (μ IU/ml) | T3 (ng/dl) | T4 (μ g/dl) |
|---------------------|----|--------------------|--------------------|------------------|
| | | $\bar{x}\pm$ SD | $\bar{x}\pm$ SD | $\bar{x}\pm$ SD |
| Schizophrenic group | 39 | 2.18 \pm 1.5a | 128.3 \pm 27.7 | 7.54 \pm 2.1 |
| Unipolar group | 22 | 0.96 \pm 0.7b | 119.37 \pm 24.3e | 7.95 \pm 2.33 |
| Bipolar group | 17 | 1.54 \pm 0.9c | 121.71 \pm 34.9f | 7.97 \pm 1.98 |
| Paranoid group | 14 | 1.34 \pm 0.8d | 121.5 \pm 26.9g | 7.48 \pm 1.89 |
| Control group | 54 | 2.17 \pm 1.4 | 133.8 \pm 34.7 | 7.91 \pm 2.2 |

a: to unipolar group ($t=3.59, p<0.01$), b: to control group ($t=3.88, p<0.01$), c: to control group ($t=1.45, 0.05<p<0.1$), d: to control group ($t=2.05<p<0.1$), e: to control group ($t=1.74, 0.05<p<0.01$), f: to control ($t=1.49, 0.05<p<0.1$), g: to control group ($t=1.53, 0.05<p<0.1$)

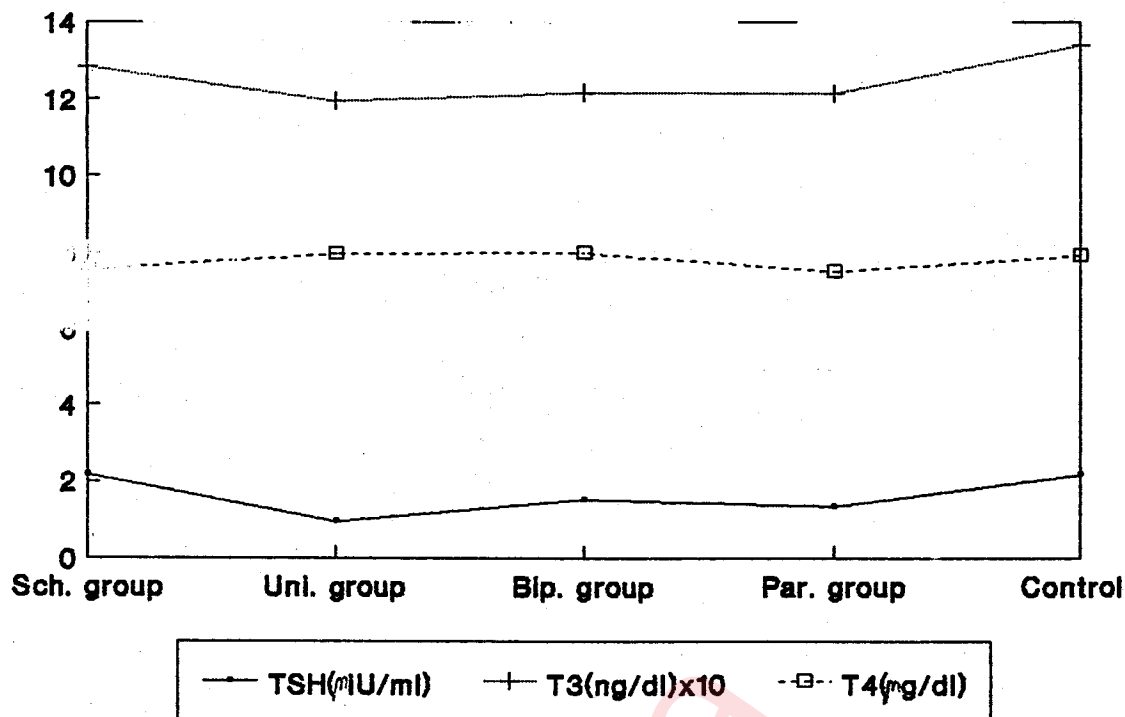


Figure 1. Mean serum TSH, T3 and T4 levels in various groups of psychiatric diseases and controls.

of the hypothalamic-pituitary-thyroid axis to the etiology and management of depressive illness has been investigated. The hormonal contribution to the effective diathesis has been studied and manipulated in the clinical management of a number of psychiatric disorders. There appears to be good evidence that the pituitary and hypothalamus play some role in psychiatric disorders (1).

In our study, basal plasma TSH levels were found statistically significantly lower in unipolar group than the in schizophrenic and the control groups. However, no difference was found in terms of T3 and T4 levels between patient and control groups. Our findings are consistent with Kjellman et al (1984), Uden et al (1987), and Banki et al (1985), but inconsistent with Gold et al (1981) and Tollefson et al (1985) (7-9,2,10).

Loosen and Prange (1982) noted the suggestion that TSH secretion may be suppressed by increased circulating plasma cortisol in major depression (Otsuki et al, 1973; Nicoloff et al, (1979) (12-14). Low plasma TSH level may be explained by putative suppressive effect of cortisol on TSH release in unipolar depressive disorders.

It can be concluded that TSH administration instead of thyroid hormone combinations which were used before is more physiologic in treatment of heterocyclic antidepressant-resistant depression.

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