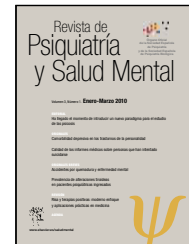


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BRIEF REPORTS

The High Prevalence of Thyroid Dysfunction in Psychiatric Inpatients

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KEYWORDS

Hypothyroidism;
Hyperthyroidism;
Psychiatric disorders

Abstract

Introduction: The relation of the neuroendocrine system with the psychiatric disorders has been described by different authors throughout history. **Objectives:** To evaluate the presence of thyroid dysfunction in psychiatric inpatients.

Methods: Observational, descriptive, retrospective study of all the psychiatric inpatients in the UHP of Vigo during the year 2006, in which the presence of thyroid dysfunction is evaluated immediately when they are admitted.

Results: Prevalence of thyroid dysfunction is 7.5% representing the hypothyroidism a 6.4% and the hyperthyroidism a 1.1%. The presence of thyroid dysfunction calculated by sex was significantly superior ($p = 0.010$) for the feminine sex (10.1%), that masculine sex (2.3%). No specific associations were found between psychiatric diagnosis, years of evolution, toxic consume or treatment and endocrine abnormalities.

Conclusions: Given the high prevalence of thyroid dysfunction in psychiatric inpatients obtained in our study we advised the screening of thyroid hormones to an under-population in which is feminine sex, people who present mood disorders, unipolar or bipolar disorder, especially in rapid cycling or mixed episodes; in refractory mood disease, in the psychotic patients and whom they are to treatment with psychiatric drugs, especially lithium.

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PALABRAS CLAVE

Hipotiroidismo;
Hipertiroidismo;
Alteraciones
psiquiátricas

Prevalencia de alteraciones tiroideas en pacientes psiquiátricos ingresados**Resumen**

Introducción: Distintos autores han descrito la relación del sistema neuroendocrino con las alteraciones psiquiátricas a lo largo de la historia. El objetivo del estudio es evaluar las alteraciones tiroideas en pacientes psiquiátricos ingresados.

Métodos: Estudio observacional, descriptivo, retrospectivo de todos los pacientes psiquiátricos ingresados en la UHP del área de Vigo durante el año 2006, en los que se evalúa la disfunción tiroidea al ingreso.

Resultados: La prevalencia de disfunción tiroidea es del 7,5% el hipotiroidismo es un 6,4% y el hipertiroidismo, un 1,1%. La presencia de disfunción tiroidea calculada por sexo fue significativamente mayor ($p = 0,010$) para el sexo femenino (10,1%) que para el sexo masculino (2,3%). No se demostró una mayor presencia de disfunción tiroidea en una enfermedad psiquiátrica determinada ni en relación con los años de evolución. Tampoco se obtuvieron diferencias estadísticamente significativas con el tratamiento ni con el consumo de tóxicos.

Conclusiones: Dada la alta prevalencia de disfunción tiroidea en pacientes psiquiátricos ingresados obtenida en nuestro estudio, aconsejamos el cribado de hormonas tiroideas a una subpoblación con predominio del sexo femenino, personas que presentan trastornos afectivos unipolares, bipolares que sean cicladores rápidos o presenten episodios mixtos; en los que presenten cuadros resistentes, en los pacientes psicóticos y en aquellos que se encuentren en tratamiento con fármacos psiquiátricos, en especial el litio.

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Introduction

The relationship between the neuroendocrine system and psychiatric abnormalities has been described by many authors over along period. Today, the influence of thyroid hormones on cerebral metabolism and serotonin concentrations is well understood.¹

Relationship Between Thyroid and Psychiatric Disease

Abnormal thyroid hormone concentrations can lead to a set of symptoms that may be confused with mental disorder, or that may be the cause of these disorders. The importance of this is that if the underlying endocrine problem is treated then this may itself change the clinical picture.²

Due to an excess of T_3 and T_4 secretion, it is common to find patients with hyperthyroidism who, in the early stages, may present clinical symptoms that may be confused with anxiety disorder. Affective symptoms have been found to precede physical manifestations in 14% of patients.³ Some patients present clear symptoms of mania¹ and even delusions and hallucinations.

In hypothyroidism, psychiatric symptoms often lead to a diagnosis of dementia or depression. On the other hand, a relatively high incidence of subclinical hypothyroidism (4%)³ has been found among patients with major depression disorder.

An association with bipolar symptoms is also relatively frequent, especially among those presenting rapid cycling. An association with psychotic symptoms is less common.⁴ Research has demonstrated that hypothyroid

and hyperthyroid states cause changes in noradrenergic, serotonergic and GABAergic receptors.

The aim of the present study was to evaluate thyroid abnormalities in psychiatric inpatients and to assess the advisability of systematic thyroid testing at admission.

Methods**Study Description**

An observational, descriptive, retrospective study of 462 psychiatric patients admitted to the Nicolás Peña Psychiatric Hospitalization Unit (PHU) of the Complejo Hospitalario de Vigo (Vigo Hospital Center), Spain during 2006. The presence of thyroid dysfunction was evaluated at admission.

Description of the Study Population

The study population included all the psychiatric patients admitted to the Nicolás Peña PHU, Vigo, Spain during 2006. Exclusion criteria: absence of thyroid symptoms at admission.

Study Sample

Data were acquired by reviewing the medical records of the Nicolás Peña Hospital, and the following variables were collected: sociodemographic, psychiatric diagnosis, toxic substance abuse, years of evolution of the psychiatric disease, thyroid hormone concentrations, presence or

absence of thyroid dysfunction at admission, previous thyroid disease, and psychiatric treatment.

The psychiatric diagnoses considered were those recorded in the discharge report; the ICD-10 classification was used. Regarding the patients who had been hospitalized more than once, the data used were those that included thyroid levels. Toxic substances included hallucinogens, hashish, cocaine, opiates, and alcohol. The years of evolution of the psychiatric disease were obtained by reviewing the medical records. The psychiatric treatments considered were those being administered at admission. Thyroid measurements were those conducted within the first 72 hours of admission. Thyroid hormone and antithyroid antibody concentrations were measured in the Clinical Analysis Service of the Xeral de Vigo Hospital, Vigo, Spain.

Description of the Instruments

Hypothyroidism was defined as TSH concentrations >10 (0.3-4.5) $\mu\text{U}/\text{mL}$ at admission. Hyperthyroidism was defined as L-T3 concentrations >4.40 (1.40-4.40) pg/mL or L-T4 concentrations >2 (0.70-2.0) $\text{ng}/100\text{ mL}$ in the presence of TSH concentrations $<0.3\mu\text{U}/\text{mL}$.

Statistical Analysis

A descriptive statistical analysis was made of all the variables, including means, standard deviations (SD), minimum and maximum values of the quantitative variables, and frequency and percentages of the qualitative variables.

The Student's *t*-test was used to compare the means of each quantitative variable in the dichotomous qualitative variable groups, the χ^2 test to compare within-group categorical variables, and ANOVA to compare the means of a quantitative variable in the qualitative variable groups with more than 2 categories. For the quantitative variables, the one-sample Kolmogorov-Smirnov test was used to verify normality; however, as the size of the sample was greater than 30, it was assumed that the distribution was normal and the Student *t*-test was applied.

The P values used for statistical significance were those applied to two-tailed tests. A P value of <0.05 was used as a cutoff for statistical significance. The SPSS software package version 15.00 was used.

Results

After analyzing the 462 medical histories, 103 patients were excluded as they had no record of thyroid dysfunction.

Sociodemographic Characteristics

The sample consisted of 359 patients: 176 men (49%) and 183 women (51%), aged between 15 years and 85 years (mean, 42.8 ± 16.6 years).

Psychiatric Diagnosis

The distribution by diagnosis was as follows: psychosis in 45.4% of the patients, unipolar disorder in 15%, bipolar

disorder in 13.6%, anxiety disorder in 0.3%, personality disorder in 17.5% and organic disorder in 8.1%

Toxic Substance Abuse

In total, 72.4% of the patients had not consumed toxic substances, whereas 27.6% had consumed some of the substances considered.

Years of Evolution of the Psychiatric Disorder

In 20.3% of the patients the disease had been evolving for less than 1 year; in 38.7% between 1 year and 10 years; in 21.2% between 10 years and 20 years; and in 19.8% more than 20 years.

Type of Treatment

A total of 22.8% were being treated with anticonvulsants; 86.6% with antipsychotics; 34.3% with antidepressants; 4.7% with lithium; and 45.4% of the patients were receiving other treatments.

Thyroid Abnormalities

The prevalence of thyroid dysfunction in the sample was 7.5% hypothyroidism, 6.4% and hyperthyroidism, 1.1%

Hypothyroidism was diagnosed at admission in 23 patients (6.4%). As 3 of these patients already had a history of hypothyroidism they were excluded from the study. Hypothyroidism was diagnosed in the remaining 20 cases (5.8%) for the first time.

Of the total number of patients, 14 patients had a history of hypothyroidism (3.9%). Of these, at admission, 3 had hypothyroidism and 1 had hyperthyroidism. This group was excluded from the thyroid function analysis at admission.

Hyperthyroidism was diagnosed in 4 patients (1.1%). Previous hyperthyroidism was diagnosed in 2 patients, and hypothyroidism in 1 case. There was a single patient with de novo hyperthyroidism (0.3%). The mean age of patients with hypothyroidism was 42.45 ± 14.965 years and the patient with hyperthyroidism was 62 years of age.

The percentage of thyroid dysfunction by sex was greater in women with thyroid disease than in men (10.1% in women vs 2.3% in men); the difference was statistically significant ($P=0.010$).

No increased presence of thyroid dysfunction was found in any specific psychiatric disease, nor was there any association with years of evolution. No statistically significant differences were found regarding treatment and toxic substance abuse.

Discussion

In the present study, a relatively high prevalence (7.5%) of thyroid dysfunction was found in psychiatric inpatients. The prevalence of thyroid abnormalities in hospitalized psychiatric patients ranges between 6% and 49%⁵ The prevalence of hyperthyroidism in the general population is 0.5% hypothyroidism in 2% of women and 0.01% of men;

and subclinical hypothyroidism in 7.5% of women and 3% of men.⁶ In our sample, hyperthyroidism had a prevalence of 1.1% and hypothyroidism, 6.4% in patients with de novo hypothyroidism, the prevalence in women was 9.5% and 2.3% in men; the prevalence of hyperthyroidism was 0.6% in women.

The greatest percentage of thyroid dysfunction found in our study corresponded to hypothyroidism (6.4%). The literature reports that between 1% and 4% of the patients with mood disorders present clinical hypothyroidism and between 4% and 40% present subclinical hypothyroidism. In the present study, the prevalence of hypothyroidism was 11.5% in the patients diagnosed with unipolar mood disorder and 6.7% in those diagnosed with bipolar mood disorder; taken together, mood disorders predominated in patients with thyroid dysfunction. The prevalence of hypothyroidism is probably higher among the patients with refractory depression.⁷ Regarding bipolar disorder, hypothyroidism is one of the factors predisposing to fast cycling.

In the present study, it was found that 35% of patients with hypothyroidism presented psychosis, as well as the patients with hyperthyroidism, and thus was the most frequent psychiatric diagnosis among the patients with thyroid dysfunction. Despite this, no conclusion can be drawn due to the fact that the sample was mainly composed of patients with psychotic disorders.

Similar to the study by Valdivieso et al,⁵ we observed a high frequency of thyroid dysfunction in patients with personality disorder (20% of patients with hypothyroidism). This may be due to comorbidity with mood disorder or to the frequent use of mood stabilizers among these patients.⁵

Thyroid abnormalities are more frequent in women in the general population. In addition, thyroid dysfunction in psychiatric patients has been associated with female gender.¹ This was confirmed in the present study, as they presented the greatest percentage of thyroid dysfunction.

No relationship was found in our study between alcohol abuse and thyroid dysfunction, but the literature reports that alcoholic patients with liver damage have low T₃ concentrations and increased TSH concentrations at baseline. One limitation of the present study was that no differentiation was made between the types of toxic substance consumed.

No statistically significant differences were found in the prevalence of thyroid dysfunction according to treatment. The reason for this may be that the study included patients who were receiving multiple medication treatment and that all the groups of drugs studied can interact with thyroid metabolism.

It has been shown that different types of drugs have effects on thyroid metabolism. It is known that lithium increases TSH concentrations in 10% to 20% of patients and leads to hypothyroidism in 3%¹ in our study, only 5% of the patients with de novo hypothyroidism were treated with lithium. The prevalence of hypothyroidism among

these patients was 6.3% although it should be taken into account that only 4.7% of the study patients received this treatment.

Given the high prevalence of thyroid dysfunction among the psychiatric inpatients in our study, we recommend thyroid hormone screening. This is not appropriate in the entire psychiatric inpatient group, but should be conducted in a subpopulation of this group: women; patients with mood disorders, especially if fast cycling or mixed episodes are presented; patients with resistant symptoms; psychotic patients; and in those receiving treatment with psychiatric drugs, especially lithium.

Generalizations cannot be made given the limitations of this study because, due to its retrospective character, there was a non-negligible amount of missing patient data; nevertheless, the sample was still representative. The types of hyperthyroidism and hypothyroidism were not differentiated, and neither was subclinical hypothyroidism with TSH concentrations between 5 μU/ mL and 10 μU/ mL taken into account, because in this case the increased TSH levels may have been due to the stress of admission. Further studies are needed with more patients who should all undergo thyroid screening at admission, using homogeneous tests and the differential diagnosis of thyroid dysfunction.

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References

1. Arce Cordón R, Baca García E, Díaz Sastre C, Baca Baldomero E. Un estudio de la función tiroidea en pacientes psiquiátricos ingresados. *Actas luso españolas de neurología psiquiatría y ciencias afines*. 1998;26:358-62.
2. Valera Besard B, Soria Dorado MA, Piédrola Maroto G, Hidalgo Tenorio MC. Manifestaciones psiquiátricas secundarias a las principales enfermedades endocrinológicas. *An. Med Interna (Madrid)* abril. 2003;20:206-12.
3. Serrano, F. Depresión en enfermedades médicas. *Anales de salud*. 2002;25:137-49.
4. Pifarré J, Sauz JA, Soler J, Vallejo J. Trastornos psicóticos e hipotiroidismo. A propósito de un caso. *Psiquiatría Biológica*. 1996;3. Available from: www.psiquiatria.com
5. Valdivieso S, Kripper C, Ivelic JA, Fardella C, Gloger S, Quiroz D. Alta prevalencia de disfunción tiroidea en pacientes psiquiátricos hospitalizados. *Rev. Méd. Chile* 2006;134:623-8.
6. Ortiz Pérez L, De la Espriella M. Thyroid Hormones and Mood Disorders. *Rev. colomb. Psiquiatría*. 2004;33:98-107.
7. Ljiljana Radanovic-Grguric; Pavo Filakovic; Jelena Barkic; Nikola Mandic; Ivan Karner; Juraj Smoje. Depresión en pacientes con alteraciones del tiroides. *Eur. J. Psychiat. (Ed. Esp)*. 2003;17:123-34.