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Psychiatric Disorders and Quality of Life in Patients with Hypothyroidism: A Narrative Review

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Abstract

Objective: To narrative review scientific articles that investigated psychiatric comorbidities and quality of life in patients with hypothyroidism.

Method: A search was conducted in three databases; ISI Web of Science, Pubmed and PsycInfo; where 1333 references were found. After the exclusion of repeated and foreign language articles, restriction to the last ten years and analysis of titles and abstracts, 27 articles were chosen to compose this review.

Results: Studies on patients with Thyroid disease; be it an excess or a deficiency of thyroid hormones, may produce psychiatric symptoms, in this instance the evidence of patients with anxiety and depression disorders is particularly noteworthy. The results of 14 studies selected for this review positively prove the association of the diagnostic with psychiatric disorders and quality of life.

Conclusion: Although the searches were carried out for psychiatric comorbidities, anxiety and depression disorders were highly prevalent in the population with hypothyroidism. Other data of paramount importance was the emphasis on treatment blocking future developments in relation to emotional health, associated with chronic hypothyroidism, thereby establishing better quality of life in this population.

Keywords: Hypothyroidism; Anxiety; Depression; Quality of life

Introduction

Hypothyroidism is diagnosed when the thyroid gland does not produce enough hormones for the necessity of the organism [1]. The thyroid is a gland of the endocrine system in the shape of a butterfly, just below the Adam's apple in the anterior region of the neck [2]. It is one of the largest glands in the human body and is also one of the most important. It is responsible for the production of two hormones, T3 (triiodothyronine) and T4 (thyroxine), which are responsible for regulating the metabolism and maintaining normal functioning of the organism [2]. Hypothyroidism is characterized by the reduction or by low production of T3 (triiodothyronine) and T4 (thyroxine) hormones. The dosage of anti-bodies against the thyroid (anti-TPO and anti-thyroglobulin) may lead to a diagnosis of Hashimoto's disease [3].

There are still no medicines which are capable of increasing the synthesis or release of thyroid hormones; as such the medical treatment is based on the reposition of the hormones with deficient production. T3 (triiodothyronine) and T4 (thyroxine) hormones are administered orally, with drugs that use thyroxine, once a day in the morning on an empty stomach [2], being the most common choice. The dosage of the medicine should be individualized for each patient according to necessity.

Reporting of anxiety and depression disorders in this population is high, since there is hormonal dysfunction; patients often report physiological symptoms of anxiety, such as sweats, restlessness, tension, irritability and distraction. They may also present muscular tension and problems sleeping [4].

Depression is also prevalent in these individuals, as a deregulated thyroid leads to symptoms of depression like disinterest, constant sensations of tiredness, lack of motivation to do many things, possible feelings of restlessness and agitation or lethargy, loss of appetite or overeating, sleeping too much or too little, feelings of uselessness and guilt and even loss of concentration [4]. Among these symptoms of depression there are also people with thoughts of self-harm or even of suicide [4].

When a patient has an overlap of anxiety and mood disorders, we conceptualize them as transdiagnostic patients [4]. This conceptualization emphasizes the common ground where there is a vulnerability to developing emotional disorders,a unified approach which considers these aspects as common and applicable to a variety of emotional disturbances already exists [4].

In this study the objective is to narrative review the scientific production in reference to the presence of psychiatric comorbidities and quality of life in patients with hypothyroidism.

Method

This study is a narrative review, whereby searches were performed in the ISI Web of Science, PsycInfo and Pubmed databases, using the terms "hypothyroidism", "anxiety", "mood" and "quality of life".

The searches were carried out in May of 2015, with a temporal restriction of the last 10 years. Articles that were reviews or repeated were excluded, as were those in languages other than English.

Results

A total of 1333 references were found, 531 in the ISI web of science database, 174 in Psycinfo and 628 in Pubmed. Of these, 729 were

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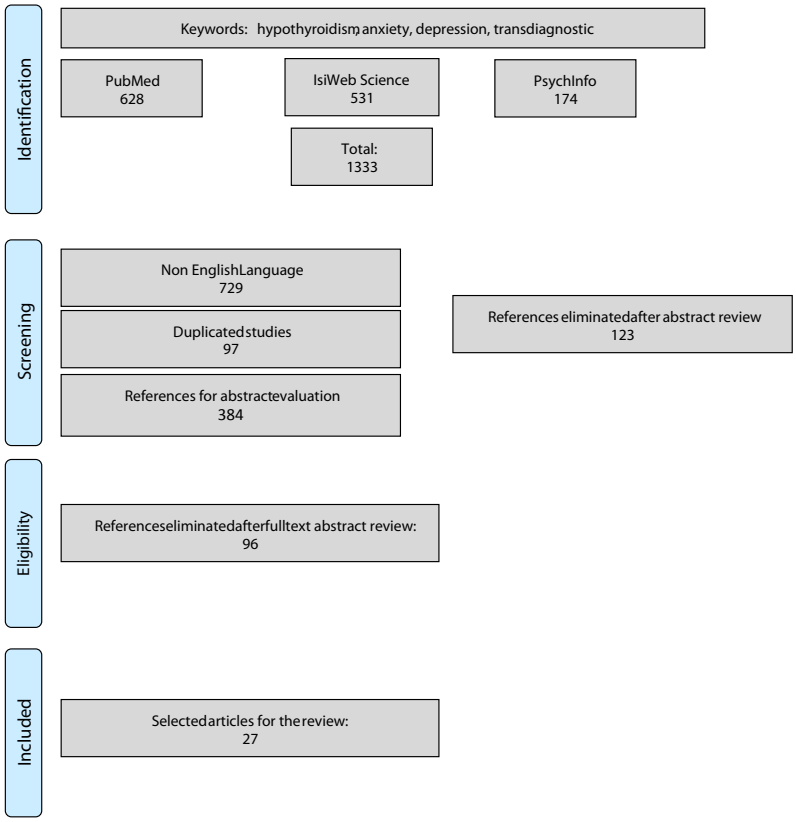

Figure 1: Hipotiroidismo prisma.

excluded for not having been published in the last ten years and written in English, leaving 604 articles, which, in an duplication cross check led to 97 more exclusions, with a further 384 restricted by title. Of the 123 remaining articles, 96 were excluded for not meeting the criteria for inclusion in the review, which resulted in 27 articles for the elaboration of this study (Figure 1).

These articles included six cross-sectional observational studies, three respective cohort studies, two prospective cohort studies, three case control studies, two longitudinal studies, one observational cohort study, two case reports, seven clinical trials and one double-blind randomized clinical trial. Many of these studies were carried out in order to evaluate the diagnostic and its associations with the psychiatric and emotional well-being of patients with hypothyroidism (Table 1).

Cross-sectional observational studies

Six cross-sectional observational studies were selected. In the first, published in 2006 by Schreckenberger [5], the HADS scale was applied to seven patients and the results were 9.08 for anxiety and 7.08 for depression. In both studies a metabolic decline in glucose occurred, with a significant correlation for the regulation of anxiety and depression where p<0.0001.

In another study, developed in 2015 by Benseñor [6], there was an association of subclinical hypothyroidism with panic disorder, [OR]=2.55; 95% confidence, 105/0994; and an inverse association between hypothyroidism and generalized anxiety disorder at [OR]=0.75; 95% CI, 059-096. Both lost significance after correction for multiple comparisons.

In 2008, Vigário et al. [7] managed to observe that patients with hypothyroidism present systematically inferior scores in all physical, psychological, social and environmental domains of SF-36, p<0.05, in relation to subclinical patients and controls. These results demonstrate dissatisfaction with the state of health of this group through impoverished quality of life.

In 2009, Guimarães et al. [8] observed a prevalence of symptoms of depression in 45.7% of their studied population with 12.3% presenting hypothyroidism. In an analysis of age, race, smoking habits and body mass index, it was shown that women with TSHN 10 ml were three times more likely to present depressive symptoms compared to those with normal levels of TSH. Among the patients with clinical hypothyroidism the OR= 8.7. Women with symptoms of depression had TSH values greater than non-depressed women: 2.98 mui/ml (CI 95% 2.39-3.58) and 2.36 mui/ml (CI 95% 2.05-2.68), respectively. The symptoms of depression were statistically associated with income, education, race, smoking, comorbidities and general state of health (p<0.05).

In the fifth study, Grabe et al. [9] analysed a final sample of 3790 participants. The results of the prevalence of thyroid disorders were found only for individuals with overt hypothyroidism (Average ¼ 55.5; SE ¼ 3.8; F ¼ 5.8; df ¼ 1. 2241; P=0.016) and for hypothyroidism (Average ¼ 65.1; SE ¼ 3.6; F ¼ 0.01; df ¼ 1. 2243; P=0.92). After distribution by sex and the following comparison, women with AIT demonstrated a tendency of higher scores for tachycardia and anxiety.

In 2005, Thomsen et al. [10] observed hyperthyroidism with affective disorder in 1374 patients, OR 3.60 (2.58-5.04) and CI 95%, and indicated results of affective disorders in hospitalized patients of

Author and year	No. of participants	Study type	Results
Schreckenberger et al. [5]	12	Cross-Sectional Observational Study	HADS scale applied and result for anxiety and depression – significant correlation.
Bonsenõr [6]	12437	Cross-Sectional Observational Study	Association of hypothyroidism with panic disorder and anxiety. Lost significance after correction for multiple comparisons.
Vigário et al. [7]	232	Cross-Sectional Observational Study	Observation of systematically inferior scores in all domains in relation to subclinical patients and controls demonstrated dissatisfaction with state of health of this group for impoverished quality of life.
Guimarães et al. [8]	1292	Cross-Sectional Observational Study	Observed the prevalence of symptoms of depression among women as being three times higher in a diagnosis of hypothyroidism.
Grabe et al. [9]	3790	Cross-Sectional Observational Study	Analyzed a sample of participants and it was concluded that the prevalence of thyroid disorder was associated with higher scores of tachycardia and anxiety.
Thomsen et al. [10]	1374	Cross-Sectional Observational Study	Observed patients with thyroid problems and affective disorder, indicated results of affective disorder in hospitalized patients.
Patten et al. [11]	3790	Retrospective Cohort Study	Investigated that the prevalence in mental disorder was greater in individuals with thyroid disease compared with other chronic diseases.
Ittermann et al. [12]	2142	Retrospective Cohort Study	Researched into whether hypothyroidism when untreated diagnosed presented symptoms similar to anxiety and depression.
Radhakrish et al. [13]	343	Retrospective Cohort Study	Analyzed results presenting a diagnosis of hyper and hypothyroidism in patients with schizophrenia and mood disorder; there were no differences in hormonal level in regard to thyroid function.
Jong et al. [14]	1219	Prospective Cohort Study	Researched patients with hypo and hyper and the results did not show a significant correlation when associated with cognitive or physical function or even symptoms of depression.
Effraimidis et al. [15]	790	Prospective Cohort Study	Investigated the exposure to stress among individuals that developed, or not, Anti-TPO. Differences in the results of stress questionnaires were not observed between hyper and hypothyroidism.
Grau et al. [16]	577	Case-Control Study	Compared with patients that had never used mood stabilizers, patients were more likely to have hypothyroidism if they had used only carbamazepine or medication with lithium and valproate. There was a relationship between mood stabilizers and risk of hypothyroidism.
Ayhan et al.[17]	96	Case-Control Study	Compared with patients that had never used mood stabilizers, patients were more likely to have hypothyroidism if they had used only carbamazepine or medication with lithium and valproate. There was a relationship between mood stabilizers and risk of hypothyroidism.
Krausz et al. [18]	10	Case-Control Study	Noted after treatment that the levels of TSH normalized in the hypothyroidism group were practically unaltered in depressed patients.
Wu et al. [32]	1000000	Longitudinal Study	Investigated the prevalence of hypothyroidism in patients with major depression disorder and in general the results were high for the population. The annual incidence and prevalence of hypothyroidism was higher in patients with major depression.
Park et al. [19]	918	Longitudinal Study	Measured the anthropometric and laboratorial characteristics of individuals with subclinical hypothyroidism and euthyroid groups, but did not find any differences in physical and mental components.
Thvilum et al. [20]	3207	Observational Cohort Study	Investigated that before the diagnosis of hypothyroidism, individuals presented an increase in the prevalence of diagnoses of psychiatric disorders, perceived a greater risk of treatment with anti-depressants and anxiolytics.
Rao et al. [21]	1	Case Report	Observed that thyroid disorders have a long association with psychiatric disorders, in the study a patient with mixed affective disorder and hypothyroidism was successful in relation to anti-thyroid medication and mood stabilizers.
Lin et al. [22]	1	Case Report	Reported on a case of Hashimoto's thyroiditis being associated with acute mania. Treated with therapy of a mood stabilizer, anti-psychotics and levothyroxine. This case highlights the importance of verifying thyroid function and evaluating anti-thyroid antibodies in middle age in female patients with affective symptoms.
Buenevicies et al. [31]	75	Clinical Trial	Studied women diagnosed with psychiatric disorders, the prevalence of social anxiety disorder, generalized anxiety disorder and depression was significantly higher.
Yu et al. [23]	Ratos	Clinical Trial	Observed results of hypothyroidism/hyperthyroidism were highly compatible with behaviours of anxiety and depression.
Mowla et al. [24]	75	Clinical Trial	Studied associations of depression with the diagnosis of hypothyroidism, what was found were symptoms of severe anxiety and agitation.
Kramer et al. [25]	1034	Clinical Trial	This study compared patients with treated hypothyroidism and confirmed that in the long-term treated hypothyroidism does not impair cognitive function or depressed mood.
Chueire et al. [26]	323	Ensaio Clínico	With the aim of determining whether subclinical hypothyroidism is a risk factor for depression in the elderly, with a division of groups and application of the MINI test concluded that depression is four times higher.
Vishnoi et al. [27]	600	Clinical Trial	Studied the association of subclinical hypothyroidism with depression, A positive correlation was found between Hamilton scores for depression and levels of TSH. These results underline the importance of thyroid screening in cases of depression.
Quinque et al. [28]	36	Clinical Trial	Evaluated alterations in brain structure and function in patients undergoing adequate long-term treatment for HT (Hashimoto's thyroiditis), no cognitive deficiencies were found.
Reuters et al. [33]	71	Double Blind Randomized Clinical Trial	Assessed the impact of subclinical hypothyroidism on quality of life, psychiatric symptoms, clinical score and muscle function. With treatment quality of life and the symptoms improved.

Table 1: Observational studies of psychiatric disorders and hypothyroidism.

14% (n=47) of those having a diagnosis of bipolar disorder compared to 15% (n=39) of patients with affective disorder.

Retrospective cohort studies

In 2006, Patten et al. [11] investigated the prevalence of mental disorder being higher in individuals with thyroid disease compared to other chronic diseases. For the examined conditions of major depression disorder, bipolar disorder, panic/agoraphobia disorder and social phobia, the prevalence after twelve months of observation was similar to a category of individuals with other chronic conditions. After adjusting for age, sex and other chronic conditions it was concluded that only social phobia was associated with thyroid disease.

In 2015, Ittermanm et al. [12] researched into untreated diagnosed hyperthyroidism presenting similar symptoms to anxiety and depression. The scales that were used were BDI II and BAI II and no significant correlation was found between TSH and anxiety. (CI 95%=1.13-4.06; p=0.020). In the sub-analysis, as well as thyroid problems, the patients were mistreated during childhood, which may have influenced the incidence of symptoms of depression and anxiety disorders.

In 2013, Radhakrishnan et al. [13] analysed the results of 468 patients presenting a diagnosis of abnormal hormone status, with hypothyroidism or hyperthyroidism in particular, with respective rates of 29.3%, 25.17% and 4.08% being observed in patients with schizophrenia spectrum disorders, with similar results being found for mood disorders. In general, there was no difference in the hormonal levels in regard to thyroid malfunction (M=40/166; F=46/165), hypothyroidism (M=35/166; F=42/165) or hyperthyroidism (M=5/166; F=4/165) between men and women. There was also no difference between genders in the individual psychiatric diagnostic categories.

Prospective cohort studies

Jongh [14] studied 64 individuals with subclinical hypothyroidism (5.3%), and 34 individuals with subclinical hyperthyroidism (2.8%). The results did not show a significant correlation when associated with impairment of cognitive or physical function or with symptoms of depression [OR] 0.44, CI 95% 22-0.86.

In 2012, Effraimidis et al. [15] investigated exposure to stress among individuals that developed or did not develop Anti-TPO. Differences were not observed in the results of stress questionnaires between hyper/hypothyroidism at any time. In cases of hypothyroidism, feelings were reported as begin less negative compared to hyperthyroidism cases.

Case-control studies

Gau et al. [16] found that compared with patients who had never used mood stabilizers, patients were more likely to have hypothyroidism if they had used only carbamazepine (OR)=1.68; 95% (CI): 1.07-2.65]; or lithium with valproate (OR=2.40; CI 95%: 1.70-3.40), or lithium with carbamazepine (OR=1.52; CI 95%: 1.10-2.08), or three mood stabilizers (OR=2.34; IC 95%: 1.68-3.25). There was a response in the relationship between the number of mood stabilizers and the risk of hypothyroidism (OR=1.34, 95% CI: 1.21-1.49) and a significant interaction between lithium and valproate in the diagnosis of hypothyroidism (p=0.020).

In 2013, Ayhan et al. [17] observed statistically significant differences between three groups in terms of major depression (P=0.001), any mood or anxiety disorder (P=0.000), any depressive disorder (P=0.020), any anxiety disorder (P=0.016) and obsessive-compulsive disorder (OCD) (P=0.013). In the Hashimoto thyroid group (HT), the prevalences of depression (P=0.000), obsessive-compulsive disorder (P=0.005) and panic disorders (P=0.041) were significantly higher than the control group. In the goiter group, depression (P=0.006), any depressive disorder (P=0.03), and any mood or anxiety disorder (P=0.000) were significantly more common in comparison to the control group. No significant difference was found between the goiter group and the Hashimoto thyroid group.

In 2007, Krausz et al. [18] noted that after treatment, levels of TSH normalized in the hypothyroidism group (1.7 +/- 1.2 um/l, range 0.3–3.7) and were practically unaltered in depressed patients (1.6 +/- 0.6 um/l, range 0.3–2.7). The average HAMD scores decreased significantly in depressed patients (p=0.00001), but not significantly in patients with hypothyroidism (P=0.4) that were within the normal limits, and were similar for both groups (5.2 +/- 5.8, range 0-13; 5.2 +/- 3.3, scale 1-10, for groups of hypothyroidism and depression, respectively). Mini Mental State Exam scores (MMSE) already within normal range prior to treatment did not increase significantly in either group (29.4 +/- 1.6, gamma 25-30; 29.5 +/- 1.4, range 26-30, for patients with hypothyroidism and depression respectively).

Longitudinal studies

Wu investigated the prevalence of hypothyroidism in patients with major depression disorder and in general the results for the population were high (1.20% vs. 0.30% [OR] 3.08 CI of 95%, 2.29–3.35) in 2005. The prevalence of hyperthyroidism was high in patients with major depression disorder compared to the general population (2.46% vs. 0.79% [OR] 2.77, CI 95% 2.29–3.35), in 2005. The annual incidence of hypothyroidism was higher in patients with major depression disorder than in the general population (0.40% vs. 0.13%; [OR] 2.47; CI 95%, 2.00–3.06). The annual incidence of hyperthyroidism was also higher in patients with major depression disorder than in the general population (0.72% vs. 0.32%; [OR] 2.06 CI 95%, 1.75–2.43).

In 2010, Park et al. [19] measured the anthropometric and laboratorial characteristics of individuals with subclinical hypothyroidism (SCH) and euthyroid groups, but did not find any differences in base characteristics such as age, body mass index (BMI), waist circumference (WC), hip circumference (HC) and body fat (BF) content, blood pressure, glucose and lipid profile, renal and liver function, and the levels of C-reactive protein (CRP). Associations of SCH with neuropsychological deficit were not significantly different. MMSE (P=0.018), FAB (p=0.049), TMLP (p=0.048) and WLRT (p=0.036) values of the SCH group were a little better than the euthyroid group, and other neuropsychological test scores of the SCH group were comparable with the euthyroid group. EDG-K scores were not affected by the presence of SCH (p> 0.1). SF-36 in general, including mental and physical components, of the SCH group did not differ from that of the normal group (p>0.1). There were no significant correlations between TSH or fT4 levels and neuropsychological tests, GDS-K scores, or SF-36 (p<0.10).

Observational cohort study

Thvilum et al. [20] investigated individuals presented an increase in the prevalence of diagnoses of psychiatric disorders ([OR]=1.51 CI 95% 1.112 – 2.04) pior to a diagnosis of hypothyroidism and also found an increase in the prevalence of treatment with anti-psychotics (OR 1.49 [IC 1.16–1.41]). After diagnosis with hypothyroidism, the patients had a greater risk of being diagnosed with psychiatric disorders HR 2.40 [IC 1.81 – 3.18], and an increase in the chance of treatment using

anti-depressants HR 1.30 [IC 1.15–1.47] and anxiolytics HR 1.27 [IC 1.10–1.47], but not anti-psychotics HR 1.13 [IC 0.91– 1.41].

Case Reports

In 2012 Rao et al. [21] observed that thyroid disorders have a long stading association with psychiatric disorders, especially mood disorders. In bipolar disorder, hypothyroidism is a common abnormality, but little is known about the association of thyroid disorders and mixed affective disorders. In this study a case of hyperthyroidism in a patient with mixed affective disorder was studied and was found to have been successfully resolved with antithyroid medication together with a mood stabilizer.

In 2013, Lin [22] reported on a case of Hashimoto's thyroiditis (TH), an auto-immune thyroiditis frequently occurring in middle-aged women, being associated in this case with acute mania. The patient was remitted after treatment with a mood stabilizer, anti-psychotics and levothyroxine. This case highlights the importance of verifying thyroid function and evaluating anti-thyroid antibodies in middle aged female patients with affective symptoms.

Clinical Trials

Buenevicius studied 27 women diagnosed with psychiatric disorders; 11 responded as having had the mental symptoms prior to diagnosis, 11 reported that they came after diagnosis and 5 said it was almost simultaneous. Significantly, the prevalences of social anxiety disorder, generalized anxiety disorder and depression, as well as symptom scores were high.

In 2015, Yu [23] realized that the hippocampus plays an important role in depression, as they understood that the variable levels of TH may lead to behavioural effects on constant anxiety and depression. In this study it was observed that the results (hippo=t = -2.887, P=0.045, Cohen d=1.58/hyper=t=6.528, P<0.001, Cohen d=0.88) were highly compatible with the observation that the hippocampus and hyperthyroidism are associated with behaviours of anxiety and depression.

Mowla et al. [24] studied the difference in patients with major depression disorder, with and without hypothyroidism, using the Ham-D-17 depression scale (p=0.471, Z=0.970). The patients with major depression disorder without hypothyroidism had worse results on item 1 (depressed mood), item 2 (feelings of guilt), item 3 (suicidality), item 6 (insomnia) and score 16 (loss of weight). In contrast, depressed patients with hypothyroidism presented more severe symptoms of anxiety and greater levels of agitation (items 9, 10, and 11). The results may help differentiate between major depression disorder (MDD) associated with hypothyroidism and MDD without hypothyroidism.

In 2009, Kramer et al. [25] studied a group with hypothyroidism treated with L-thyroxine for an average of 20 years. Those with treated hypothyroidism were older than the euthyroid group (76.1 +/- 9.6 vs 73.6 +/- 10.2 years, P=0.005) and were frequently women (81.6 vs. 54.8%, P<0.001). The levels of TSH were similar between the groups (median interquartile range=1.57 (1.19) vs. 1.54 (1.59) mIU/l, P=0.81). In comparison with the euthyroid group, the hypothyroidism group was treated with anti-depressants more frequently (19.5 vs. 8.5%, P<0.001), despite similar BDI scores. The results show that in the long term, treated hypothyroidism does not impair cognitive function or depressed mood.

Chueire [26], with the aim of determining whether subclinical hypothyroidism is a risk factor for depression in the elderly, evaluated a total of 323 individuals over 60, using the MINI interview to assess mood disorder. The patients were divided into Group I: 252 patients (184 female, 68 male; average age: 67; range: 60-89) with high serum TSH levels and Group II: 71 patients (45 women and 26 men with average age: 67; range: 60-92) with a diagnosis of depression. TSH and free thyroxine (free T4) were measured by sensitive assays. Depression was observed in 24 (9.5%) patients in group I and was more frequent in patients with subclinical hypothyroidism (14/24=58.3%). On the other hand, high levels of TSH were found in 22 (30.9%) patients in group II. Depression was observed as being higher in individuals with a diagnosis of subclinical hypothyroidism (74/149=49.7%) than among individuals with hypothyroidism (21/125=16.8%) (P<0.001). Subclinical hypothyroidism increased the risk of presenting depression fourfold (OR=4.886; 95% CI=2.768-8.627).

Vishnoi [27] studied the association of subclinical hypothyroidism (SCH) with depression and also investigated the effects of L-thyroxine (LT4) as a treatment to improve symptoms. 300 patients with SCH were observed, and the serum levels of TSH, FT3 and FT4 in 133 patients submitted to LT4 treatment for two months were evaluated, along with Depression using the Hamilton scale (HAM-D). HAM-D scores were significantly higher, especially in diagnosed cases (10.0 +/- 4.7), in comparison with controls (2.4 +/- 1.5). A positive correlation (r2=0.87, p=0.00) was found between Hamilton scores and levels of TSH. These results underline the importance of thyroid screening in cases of depression.

In 2014, Quinque et al. [28] evaluated alterations in brain structure and function in patients undergoing adequate long-term treatment for Hashimoto's thyroiditis; with the intention of examining residual complaints in patients related to possible long-term neural alterations, with specific interest in the underlying autoimmune process. The neuropsychological evaluation included memory, working memory, psychomotor speed and attention. Thyroid hormone stimulator, free thyroxine and thyroid peroxidase antibodies were measured in serum. The study did not find cognitive deficiencies or alterations in density of grey matter; functional connectivity or brain activity related to associative memory in comparison with the control group, and cognition was not related to the measurements of thyroid serum in the patient group.

Double Blind Randomized Clinical Trial

Reuters assessed the impact of subclinical hypothyroidism (SHT) on quality of life (QL), psychiatric symptoms, clinical score and muscle function. In this double blind randomized study, the patients were distributed, for treatment (n=35) or placebo (n=36). The clinical and psychiatric symptoms were evaluated using the Zulewski, Hamilton and Beck scales. Treatment improved inspiratory muscle (IS) strength (11.5 ± 17.2, p=0.041), as well as QV domains of "Pain" and "Role Physical" (19.7 ± 15.2, 0.039 and 22.1 ± 47.5, p=0.054). The clinical and psychiatric symptoms presented similar responses in both interventions.

Discussion

According to the available literature, alterations in thyroid state in adults are related to changes in quality of life, principally in the psychological domain and in mood disorders. Therefore, this population probably requires greater emotional care due to the increased risk of anxiety and depression disorders, since this disease also currently affects 1 to 3% of the population [29].

Thyroid hormones have a critical role in metabolic activity and neuropsychiatric manifestations. Studies show that metabolism disturbances of the thyroid in mature brains profoundly alter mental function, influencing cognition and emotion [29].

The most frequent thyroid diseases in adult life are autoimmune diseases, such as autoimmune thyroiditis (Hashimoto's), this being the most frequent cause of hypothyroidism (inadequate hormone production). According to research, there are three important antibodies that are involved in autoimmunity of the thyroid: thyroglobuline antibodies, thyroid peroxidase antibodies (TPO) and antibodies of thyroid stimulator hormone receptors. Both hyperthyroidism and hypothyroidism are associated with changes in mood and intellectual performance. Moreover, the studies indicate that severe hypothyroidism may also cause depression and dementia [29].

In the literature it can be observed that there is a prevalence of anxiety in patients with thyroid disorder, the most prevalence anxiety disorders begin social phobia and generalized anxiety. Besides this high prevalence of anxiety, studies also compare hypothyroidism with symptoms of depression and impoverished quality of life [9,13,17,19,24,30-32].

Current research has shown depression to be more frequent in patients with hypothyroidism [8,16-28,31-33]. Other disorders such as panic, obsessive compulsive and schizophrenia are not very prevalent [11,16,22,33]. Other recent studies have examined cerebral and functional alterations in the long-term, carrying out neuropsychological evaluations of memory, working memory, psychomotor speed and attention, but have not encountered anything of great relevance in their findings [14,15,19].

Of the 27 studies selected for this review, 14 describe analyses on the involvement of hypothyroidism with depression and/or anxiety [5,9,17,12-19,22-26], positively proving associations through testing, comparisons between groups and even through treatment. This demonstrates the high necessity for assessment of psychiatric disorders in patients with hypothyroidism.

Distinctive characteristic patterns for depression and hypothyroidism have also been observed in studies involving functional imaging [2,33]. There is a great disparity between patients with thyroid disease and depression in respect to the response to treatment with hormonal thyroid for neuropsychiatric symptoms in the long-term [8,19,23].

The prevalence of thyroid disease was found to be much higher in women than in men, and also higher with age [13,22]. The greatest anomaly detected was subclinical hypothyroidism, which was prevalent in as many as 20% of post-menopausal women [16,21]. It is recommended that from the age of 35 women should test for TSH dosage, as they are five times more affected than men [16,23].

Some studies demonstrate the importance of medical and psychological treatment after diagnosis, with the aim of maintenance and prevention in emotional care [22,23,25,33]. Research indicates that treated hypothyroidism does not impair cognitive function or depressed mood [12,33].

In this review there were limitations in the association of hypothyroidism with non-medicinal treatment, such as psychotherapy (to prevent/treat emotional symptoms), and in the necessary care of the population at risk, especially in regard to information on seeking laboratorial tests that may provide a diagnosis and assist in early treatment.

Conclusion

The present study emphasises the relevance of hypothyroidism and the necessity of special attention in relation to psychiatric comorbidities, among which anxiety and depression are highlighted. When such disorders are overlapping they can be considered trans-diagnostic.

Therefore, it is important for the patient to seek treatment upon receiving a diagnosis of hypothyroidism, in order to avoid and/or impair future developments in relation to emotional health that may be associated with the chronic nature of the disease. It is affirmed that, early treatment is relevant for everyone in the population, as when the patient has their emotions regulated; this also increases their quality of life. The mental health of these patients can be enhanced, not only through medicinal treatment but also through psychotherapy.

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