

SUBCLINICAL HYPOTHYROIDISM AND PSEUDODEMENCE – LITERATURE REVIEW

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Abstract: Introduction: Thyroid hormones are essential for brain development. Disabilities due to lack of these often result in mental retardation (PRZYBYLAK M, et al., 2021). **Goal:** To review the relationship between subclinical hypothyroidism and pseudodementia. **Result:** Cognitive dysfunctions in this scenario mainly refer to memory, spatial organization skills, attention and reaction time. These situations, which are sometimes reversible, are known as “pseudodementia” and highlight the importance of a thorough evaluation before diagnosing dementia (Bégin ME, et al., 2008). **Conclusion:** Subclinical hypothyroidism is more prevalent in the elderly and is often associated with pre-existing cognitive impairment and, for this reason, organic causes must always be sought when there is a significant decline in mental functions. **Keywords:** Hypothyroidism; Pseudodementia; Cognitive impairment.

INTRODUCTION

Thyroid hormones are essential for brain development, affecting processes such as neuronal growth, myelination, synaptogenesis and neurotransmitter metabolism. Deficiencies due to lack of thyroid hormones due to maternal gland problems during pregnancy or at any time in life can lead to serious neurological and mental problems, often resulting in mental retardation. These hormones also play a crucial role in regulating mood and cognitive function (PRZYBYLAK M, et al., 2021).

Thyroid hormones do not end their role after the formation of the brain, as they are crucial for the lifelong functioning of the central nervous system, being essential for several brain processes. This role is especially notable in maintaining plasticity, that is, the ability to create new synaptic connections and learn new tasks. Furthermore, the adequate

secretion of these hormones is vital for the functioning of virtually all neurotransmission systems in the brain (Jurado-Flores M, et al., 2022).

In healthy individuals between 61 and 90 years of age, there is a decrease in the secretion of T4 and T3. Cognitive functions are affected and disturbances in the secretion of thyroid hormones may occur. However, serum levels, especially T4, may remain normal or even slightly elevated. This is due to the reduced rate of T4 breakdown in the body in this age group (Lekurwale V, et al., 2023).

Due to the relevance of thyroid hormones to brain development and proper functioning, it is understandable that mental disorders may arise in diseases of the thyroid gland. In hyperthyroidism, there are often anxiety and mood disorders, including manic and depressive episodes. Thyroid overactivity can even lead to delusional states. On the other hand, hypothyroidism is linked to psychomotor retardation, increased drowsiness and varying degrees of cognitive impairment. This last aspect is particularly relevant in terms of scope, intensity and future impact (Lekurwale V, et al., 2023).

There are still many doubts surrounding the subclinical form of hypothyroidism, manifested by inhibition of thyroid-stimulating hormone (TSH) secretion, with normal levels of T3 and T4. Subclinical hypothyroidism (HS) is subdivided into two groups based on TSH levels: the first stage occurs when TSH is between 0.1-0.4 mU/l and the second stage occurs with values below 0.1 mU/l (PRZYBYLAK M, et al., 2021).

Subclinical hypothyroidism affects 5% to 17% of the general population, with a tendency to increase with age. In individuals over 60 years of age, it is estimated to affect around 20% of women and 9.5% of men. At age 74, these rates are approximately 21% for women and 16% for men (PRZYBYLAK M,

et al., 2021).

Cognitive dysfunctions in this scenario mainly refer to memory, spatial organization skills, attention and reaction time. The impact on cognitive functions due to hypothyroidism can reach a point where it is difficult to distinguish from dementia caused by degeneration of the central nervous system. These situations, which are sometimes reversible, are known as “pseudodementia” and highlight the importance of a thorough evaluation before diagnosing dementia (Bégin ME, et al., 2008).

Cognitive impairment related to hypothyroidism is usually part of a more comprehensive psychopathological picture, which also includes concentration difficulties, mood changes and, occasionally, perception disorders. Hyperthyroidism can also lead to cognitive dysfunction, but with less intensity compared to hypothyroidism. Disorders frequently observed in studies include reduced performance in attention and memory tests, as well as disturbances in the synchronization of visual stimuli with motor activities (PRZYBYLAK M, et al., 2021).

A very controversial issue, but at the same time of great clinical significance, is the possibility of recovery from the above disorders after leveling thyroid hormone levels (PRZYBYLAK M, et al., 2021).

It was observed that at least some of the cognitive dysfunctions, especially related to attention and verbal memory, persisted even after treatment with L-thyroxine preparations. This presence was also confirmed after more than five years of normalization of thyroid hormone levels. Similarly, in cases of hyperthyroidism, especially the most severe ones, there is only a partial recovery of cognitive functions (Tan ZS, et al., 2008).

Compared to clinical forms of hypo- and hyperthyroidism, we have less information about cognitive disorders in subclinical forms

of hypothyroidism. This is relevant given that subclinical hypothyroidism is more prevalent in the elderly and is often associated with pre-existing cognitive impairment. Some studies suggest a relationship between HS and the degree of progression of cognitive impairment. The presence of this correlation is pointed out by several longitudinal studies that highlight that the development of cognitive dysfunction towards dementia was more noticeable in individuals with subclinical hypothyroidism (Tan ZS, et al., 2008).

From a clinical point of view, the key question is to determine whether therapeutic intervention, based on replacement treatment, in individuals with subclinical hypothyroidism results in the resolution of already evident cognitive disorders (PRZYBYLAK M, et al., 2021).

A similar relationship can also be applied to subclinical forms of hyperthyroidism, which by some authors are also recognized as risk factors for Alzheimer's disease. The relationship appears to be, to some extent, conditioned by sex and is more pronounced in women (PRZYBYLAK M, et al., 2021)

MATERIAL AND METHODS

The search was carried out in the PubMed database and was limited to articles between 1989 and 2023 that met the criteria of being literature reviews and case reports.

Next, the keywords in the article titles were

analyzed and those whose themes best fit our objective were selected.

A total of 6 articles were selected for full reading.

DISCUSSION

A rather controversial issue, but at the same time of great clinical significance, is the possibility of recovery from the above disorders after leveling thyroid hormone levels. From a clinical point of view, the key question is to determine whether therapeutic intervention, based on replacement treatment, in individuals with subclinical hypothyroidism results in the resolution of already evident cognitive disorders (PRZYBYLAK M, et al., 2021).

CONCLUSION

Cognitive dysfunctions in this scenario mainly refer to memory, spatial organization skills, attention and reaction time. These situations, which are sometimes reversible, are known as "pseudodementia" and highlight the importance of a thorough evaluation before diagnosing dementia. Subclinical hypothyroidism is more prevalent in the elderly and is often associated with pre-existing cognitive impairment and, for this reason, organic causes must always be sought when there is a significant decline in mental functions (Bégin ME, et al., 2008).

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