

Original Research Article

Study of Hypothyroidism in Headache patients

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Abstract: Hypothyroidism is a common endocrine disorder resulting from deficiency of thyroid hormone. Headache is among the most common reasons that patients seek medical attention. Hypothyroidism may be an exacerbating factor for some primary headaches. Furthermore, hypothyroidism may be a risk factor for incident new daily persistent headache. The purpose of this study was to determine the frequency of hypothyroidism in adults with headache. In this cross-sectional analytical study, the thyroid function tests of all patients having headache, who were referred to the General Medicine OPD of a tertiary care centre from January 2015 to December 2016 in Indore, India, were measured. The study population included 1455 patients with headache. Among them, 450 patients had migraine without aura, 401 patients had tension-type headache, 350 patients had migraine with aura, 98 patients had cluster headache, and 156 patients diagnosed with other primary headaches. Among 1455 patients, 13 patients (0.89%) were found to have overt hypothyroidism and 30 patients (2.06%) had subclinical hypothyroidism. Therefore, the prevalence of hypothyroidism was 2.95% in headache cases. We found a high prevalence of hypothyroidism in headache patients, significantly higher than in the general population. Because hypothyroidism is a treatable cause of secondary headaches, clinician should be aware of this relationship.

Keywords: Hypothyroidism, headache, migraine

INTRODUCTION

Hypothyroidism is a common endocrine disorder resulting from deficiency of thyroid hormone. In iodine sufficient area, autoimmune thyroid disease (Hashimoto disease) is the most common cause of hypothyroidism; worldwide, iodine deficiency remains the foremost cause [1, 2]. The patient's presentation may vary from asymptomatic to myxedema coma with multisystem organ failure. Because nearly all metabolically active cells require thyroid hormone, deficiency of the hormone has a wide range of effects. Hypothyroidism commonly manifests as a slowing in physical and mental activity but may be asymptomatic. Symptoms and signs of this disease are often subtle and neither sensitive nor specific. Classic signs and symptoms (eg, cold intolerance, puffiness, decreased sweating, and coarse skin) may not be present as commonly as was once believed. Consequently, the diagnosis of hypothyroidism is based on clinical suspicion and confirmed by laboratory testing.

Headache is among the most common reasons that patients seek medical attention. Diagnosis and management is based on a careful clinical approach that is augmented by an understanding of the anatomy, physiology, and pharmacology of the nervous system pathways that mediate the various headache syndromes. Primary headaches are disorders in which headache and associated features occur in the absence of any exogenous cause. Hypothyroidism may be an exacerbating factor for some primary headaches. Furthermore, hypothyroidism may be a risk factor for incident new daily persistent headache [3]. The purpose of this study was to determine the frequency of hypothyroidism in adults with any type of headache.

MATERIALS & METHOD

In this cross-sectional analytical study, the thyroid function tests of all patients having headache,

who were referred to the General Medicine OPD of a tertiary care centre from January 2015 to December 2016 in Indore, India, were measured. Patients with primary hypothyroidism have elevated TSH levels and decreased free hormone levels. Patients with elevated TSH levels (usually 4.5-10.0 mIU/L) but normal free hormone levels or estimates are considered to have mild or subclinical hypothyroidism. A headache disorder was diagnosed by any of the following: (1) physician diagnosis of tension headache, migraine, or cluster headache at the time of one of the examinations, (2) self-report of "frequent headaches" from the standardized review of systems (ROS) from the initial physical examination, or (3) use of headache-specific abortive medications (eg, triptans, ergots, isometheptan or butalbital-containing medications) at any time prior to a diagnosis of hypothyroidism.

RESULTS

The study population included 1455 patients with headache. Among them, 450 patients had migraine without aura, 401 patients had tension-type headache, 350 patients had migraine with aura, 98 patients had cluster headache, and 156 patients diagnosed with other primary headaches. Mean age (\pm SD) of patients was 35.4 \pm 13.5 years. Mean duration of headache was 9.8 \pm 3.6 years. Female preponderance was seen in our study (Male: female ratio 1.62:1). Among 1455 patients, 13 patients (0.89%) were found to have overt hypothyroidism and 30 patients (2.06%) had subclinical hypothyroidism. Therefore, the prevalence of hypothyroidism was 2.95% in headache cases.

DISCUSSION

Our results are consistent with past studies demonstrating headache and hypothyroidism to be comorbid conditions [5-8]. There are several proposed mechanisms to explain the association between headache disorders and hypothyroidism. Two potential mechanisms to explain a causal relationship include alterations in the immune system and autonomic nervous system. Alterations in the immune system that occur as a result of headache disorders and/or migraine might directly cause Hashimoto's thyroiditis. Human studies have reported elevations in C-reactive protein (CRP) and alterations in the proportions of T lymphocytes in migraineurs during interictal time periods as well as elevations of cytokines and leukocyte adhesion molecules during an acute migraine attack [9]. Likewise, deviations in serum cytokines, humeral/cellular immunity, and leukocyte cell surface receptors exist in Hashimoto's thyroiditis [10]. Therefore, one might theorize that inflammation that

occurs as a result of migraine might predispose to thyroid autoimmunity.

Several studies have shown decreased sympathetic nervous system activity during interictal time periods in migraine patients [11]. Catecholamines promote the conversion of thyroxine (T4) to the much more active triiodothyronine (T3) and may directly induce mitosis in the thyroid gland [12]. Thus, migraineurs with sympathetic hypo function may be at a greater risk for migraine and hypothyroidism. Shared genetic mechanisms may explain the association as elevated serum homocysteine levels has been found in both disorders [13]. Genetic analyses have linked the C677T polymorphism of the methyl tetra hydro folate reductase (MTHFR) gene to migraine and the homozygous variant of this polymorphism has been shown to be associated with Hyper homocysteinemia [14]. A meta-analysis demonstrated elevated plasma homocysteine to be associated with hypothyroidism which is consistent with the results of this study [13]. Therefore, hyper homo cystemia as a result of MTHFR gene mutations could predispose to both migraine and hypothyroidism.

CONCLUSION

We found a high prevalence of hypothyroidism in headache patients, significantly higher than in the general population. Because hypothyroidism is a treatable cause of secondary headaches, clinician should be aware of this relationship.

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