Primary hypothyroidism masquerading pituitary macroadenoma

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Abstract

Diffuse and reactive pituitary gland enlargement secondary to primary hypothyroidism is an uncommon occurrence and that can masquerade many pituitary disorders. In present article, we report a case of 19 year female severe hypothyroidism presenting with diffuse enlargement of pituitary gland and hyperprolactinemia and review the clinical importance of this entity. Knowledge of this entity is very important to avoid unnecessary surgery and irreversible complications in this sub-group of patients.

Key words: Pituitary hyperplasia, primary hypothyroidism, pituitary hyperplasia.

Introduction

Diffuse and reactive pituitary gland enlargement secondary to primary hypothyroidism is an uncommon

occurrence and that can masquerade many pituitary disorders. (1-8) In present article, we report a case of severe hypothyroidism presenting with diffuse enlargement of pituitary gland and hyperprolactinemia.

Case report

A 19 year female presented with headache of one year duration and one episode of seizures. There was history of galactorrhoea. There was no history of loss of appetite and cold intolerance. She had easy fatigability and no visual symptoms. Her general and systemic examination was unremarkable. Higher mental functions and cranial nerves were normal. Motor and sensory examination was normal. Deep tendon reflexes were sluggish. Routine blood investigations were within normal range, except low level of hemoglobin (9.1 gm / dL). Hormonal profile revealed raised thyrotropin stimulating hormone (TSH)

(>100 microIU/dL, range 0.34-5.6) and low T4 (0.10 microgram/mL, range 0.61-1.12). Prolactin was 200 IU/dL. Magnetic resonance imaging (MRI) of the brain showed a large diffuse sellar mass lesion, hypointense on T1W images and uniformly enhancing after contrast administration (Figure 1 and 2). Based on clinical features, investigation reports (increased TSH and prolactin secretion) and imaging findings a diagnosis of diffuse pituitary hyperplasia secondary to primary hypothyroidism was made. The patient was started on 100 microgram thyroxine.

Discussion

Pituitary hyperplasia is a process and ranges from the slight increase in the number of normal cells without much change in the tissue architecture to massive enlargement of the gland with significant alteration in both tissue architecture and morphology. (9) Thyrotroph hyperplasia is the most common cause of pituitary enlargement in the context of untreated primary hypothyroidism. (2, 10) The incidence of pituitary hyperplasia in hypothyroidism ranges from 25% to 81% (11) and the incidence is high if the TSH levels are >50 microIU/mL. (12) It has been suggested that the primary uncontrolled hypothyroidism can be a precursor to pituitary hyperplasia. (2) Low thyroxine levels in these patients results in the loss of negative control on hypothalamo-pituitary-thyroid axis resulting in the increase of thyrotroph

releasing hormone (TRH) from hypothalamus which increases the thyroid stimulating hormone (TSH) from pituitary in an attempt to maintain the normal thyroxine levels (3, 7, 13-16)

Figure 1

MRI brain axial images showing diffuse enlargement of the pituitary gland, it was hypointense on T1W images and diffusely enhancing after contrast administration

Figure 2

MRI brain sagittal and coronal post-contrast images showing diffuse enhancement of pituitary gland

As was seen in present case, TRH also exerts a weak stimulatory effect on lactotroph cells resulting in mild to moderate hyperprolactinemia is expected. (13) Because TRH also has a weak stimulatory effect on lactotroph cells, mild to moderate hyperprolactinemia may also occur in about three-quarters of patients. (11) Clinically the patients with pituitary hyperplasia can present with headache, visual symptoms and features of hypothyroidism. (1, 3, 7, 14) It is important to understand that the headache may be due to hypothyroidism, although the exact underlying mechanism is not clear. (7) In many cases pituitary hyperplasias may be clinically silent and focal pituitary hyperplasia can be an incidental finding at autopsy. 9 The diagnosis of pituitary hyperplasia can be difficult and it needs a high degree of clinical suspicion. (1-4, 6-8, 11, 12, 14, 15, 17) Radiological investigations i.e. CT and MRI with contrast administration will show the enlargement of pituitary gland. MRI is superior to CT scan and a follow up imaging will further help to monitor the size of the gland. (4, 6, 18-22) Detail thyroid functions are the mainstay of diagnosis as it will show decrease in the levels of serum T3 and T4 but greatly elevated serum TSH levels. (2, 3, 6) One the diagnosis of pituitary hyperplasia secondary to primary hypothyroidism is suspected the patients can be managed with adequate hormone replacement with L-thyroxine (25 to 300 mcg/day) and in most of the cases this will result in relief of

symptoms and regression of pituitary hyperplasia within a few months. (1-4, 6-8, 11, 12, 14, 15, 17) In a selected group of patients where there is compression of the optic chiasm, does not respond to, or worsens under, thyroid hormone replacement or the diagnosis is in doubt surgery may be considered as an option. (23) Although imaging findings will not distinguish between TSH-producing macroadenoma and hyperplasia of pituitary gland, only the follow up imaging and response to replacement therapy will support the diagnosis. (24)

Conclusion

In summary, diffuse pituitary enlargement can be a manifestation of severe primary hypothyroidism and interpretation of a pituitary mass without an endocrine investigation can lead to unnecessary surgery (4, 5, 22, 25, 26). A knowledge of this entity is very important to avoid unnecessary surgery and irreversible complications in this sub-group of patients.

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