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Pituitary Hyperplasia Secondary to Primary Hypothyroidism

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Abstract

We describe an omani boy who presented with short stature and goiter with thyroid dysfunction suggestive of autoimmune thyroiditis.There was clinical and biochemical improvement after 6 months of thyroxine replacement therapy .Pituitary imaging showed normalization of pituitary hyperplasia size on MRI pituitary.

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Introduction

Primary hypothyroidism either congenital or acquired can lead to elevated TRH which causes both pituitary thyrotroph and lactotroph hypertrophy resulting in pituitary hyperplasia. Biochemistery of thyroid shows high TSH and prolactin secretion. However prolactin level is usually less marked in hypothyroidism as compared to pituitary tumour. Thyroxine replacement results in regression of pituitary hyperplasia within few months. We report a child with pituitary hyperplasia secondary to primary hypothyroidism.

Test	Before treatment	6 months post-treatment	Reference range
f T4	< 3.2	10	9 – 15 pmol/L
TSH	>100	2.8	0.5 – 5 mIU/L
Prolactin	1384	240	56 -276 pmol/L
Cortisol	400	-	185 – 624nmol/L
Thyroid antibodies	>500	> 500	0 – 35 U/ ml
ACTH	12.3	-	1.6 – 13.9 pmol/L

Table 1: Investigation before treatment and 6 months post- treatment

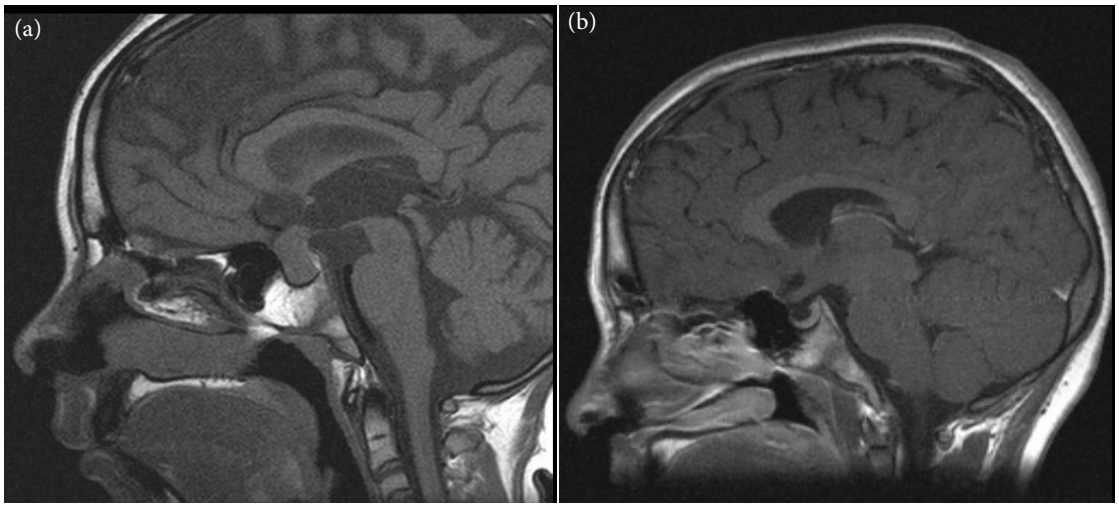

Figure 1: (a) Pituitary Hyperplasia and (b) Regression after treatment

Case Report

A 13 years old omani boy who presented at 10 years of age with short stature and goiter. There was no history of hypothyroidism in the family. The clinical examination revealed prepubertal boy with an apathetic look, cold dry and thick skin. His height was 126.4 cm & weight 33 kg both below the 3rd centile. His systemic examination apart from short stature and goiter was unremarkable. His investigations are mentioned in Table 1.

The ultrasound of thyroid gland showed normal vascularity of the gland with normal echogenicity of right lobe and isthmus but reduction in the echogenicity of left lobe. MRI pituitary showed pituitary hyperplasia showing homogenous enlargement of the pituitary gland (11 x13 x18 mm) filling and expanding the pituitary fossa with upward extension pushing the diaphragmatic sellae as well as optic chiasma. Pituitary hyperplasia regressed with 6 months of adequate levothyroxine replacement. Thyroid hormone therapy

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resulted in decrease in size of pituitary gland on follow up MRI shown in figure below.

Discussion

Long term Thyroid dysfunction lead to increased hypothalmo-pituitary activity and one of most important cause of Pituitary hyperplasia. Although It is more commonly seen in adults, it is rarely seen in children with primary acquired hypothyroidism and missed cases of congenital hypothyroidism. There is reduced thyroxine, increased TSH and prolactin secretion. Adults usually present with clinical features of hypothyroidism and /or neurological symptoms mainly headache, visual disturbances & galactorrhea. Childhood presentation is short stature and goiter but neurological symptoms can be rarely seen. Pituitary hyperplasia is described in adults from 25 % to 81 % in different series in autoimmune thyroiditis. Franceschi et al. reported pituitary hyperplasia in hypothyroidism which regressed after thyroxine replacement.

Long standing hypothyroidism can also lead to reduction in one or more pituitary hormones and can present with pan-hypopituitarism. Full pituitary hormonal assessment should be done in suspected cases of hypopituitarism. However in children with acquired hypothyroidism, growth hormone status should be assessed after normalization of thyroid status. The time interval for regression of pituitary hyperplasia is variable from weeks to few years. The recommended and appropriate replacement therapy for hypothyroidism is levothyroxine. In our patient thyroid hormone therapy resulted in decrease in size of pituitary gland on follow up MRI. Evaluation & management of pituitary hyperplasia without an endocrine work up can lead to unnecessary surgery which can cause complications. The pediatricians as well as endocrinologists should be aware of association between hypothyroidism and Pituitary hyperplasia and the need for full pituitary hormonal assessment before considering neurosurgical/neurological evaluation. Pituitary imaging is indicated after appropriate management with thyroxine for 6 to 12 months for reversal of pituitary hyperplasia.

Competing Interests

The authors declare that they have no competing interests.

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