Review Article

Oral Manifestations In Pituitary Disorders

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Abstract

Pituitary is considered as the master gland of the body. It is located in the sella turcica, and is divided into two anatomically, functionally, and developmentally distinct structures, the anterior pituitary or adenohypophysis and posterior pituitary or neurohypophysis. The anterior lobe, or adenohypophysis, produces and secretes 6 hormones and posterior pituitary secretes two hormones. Growth hormone is of vital importance for normal growth and development. Individuals with growth hormone deficiency results in a condition known as pituitary dwarf with disproportionate delayed growth of skull and facial skeleton giving them a small facial appearance for their age. Growth hormone excess leads to gigantism if it occurs before completion of the growth and acromegaly results if it occurs after the fusion of the growth plates. Dental professionals may be the first health care providers to see the signs and symptoms of growth disorders, and thus have the first opportunity to correctly diagnose this serious disease.

Key words: growth hormone, dwarfism, acromegaly, gigantism.

Introduction

The adult pituitary gland weighs approximately 500-600 g and is typically 1.2-1.5 cm in diameter and 0.5 cm thick, occupying approximately 80% of the sellar space. The pituitary gland consists of anterior and posterior lobes connected by middle, intermediate lobe. The anterior lobe, or adenohypophysis, produces and secretes six hormones essential for metabolic function throughout the body.\(^1\)

The posterior lobe, the neurohypophysis, produces and secretes two hormones: antidiuretic hormone and oxytocin. The neurohypophysis arises from the
hypothalamus during fetal development. Anterior and posterior lobes are separated by a section of avascular tissue called the pars intermedia or intermediate lobe. The pars intermedia was originally thought not to function in humans; however, some have suggested that this portion of the pituitary plays a role in producing hormone precursors and a small amount of melanocyte-stimulating hormone. Secretion of pituitary hormones is controlled by the hypothalamus through a negative feedback system. The hypothalamus produces and secretes releasing and inhibitory hormones that are delivered to the anterior pituitary gland through an arterial vascular system called the hypothalamic-hypophysial portal system. By contrast, the hypothalamus delivers neuronal impulses directly to the tissue of the posterior pituitary gland. These impulses control the release or inhibition of hormones produced in that lobe.

In man, some indication of the role played by pituitary in development of intraoral and extraoral tissues can be gained from studies of hypopituitarism as well as hyperpituitarism. This article aims at reviewing the various oral and extraoral manifestations seen in pituitary gland disorder.

**Hypopituitarism**

Hypopituitarism is caused by compression or atrophy of anterior pituitary cells or a reduced capacity of the tissues to respond to growth hormone resulting in the condition known as pituitary dwarfism.

**Pituitary dwarfism**

The most striking feature of pituitary dwarfism is short stature of the affected patient and the low growth velocity for age. The maxilla and mandible of affected patients are smaller than the normal and the face appears smaller with the permanent teeth showing a delayed pattern of eruption. Often the shedding pattern of deciduous teeth is delayed by several years, and also the development of roots of permanent teeth appears to be delayed. The dental arches are smaller than the normal and therefore cannot accommodate all the teeth resulting in dental malocclusion. Complete absence of buds of wisdom tooth even in patient in fourth decade of life is also reported. Other rare findings such as agenesis of the upper central incisor and solitary maxillary central incisor have been observed. Amelogenesis imperfecta a diverse group of hereditary disorder that is characterized by defect in formation of tooth enamel has also been seen in patient with reduced amount of growth hormone.

**Hyperpituitarism**

An increase in the number of granules in the acidophilic cells or an adenoma of the anterior lobe of the pituitary is associated with the condition known as gigantism or acromegaly. If the increase in production of growth hormone occur before the closure of the epiphyseal of the long bone, gigantism results and if the increase in amount of growth hormone occurs after the closure of the epiphyseal of the long bone it results in the condition known as acromegaly.
**Gigantism**

Gigantism is the childhood version of growth hormone excess and is characterized by the general symmetrical overgrowth of the body parts. Gigantism may be distinguished from that of precocious puberty by the fact that in gigantism, the growth occurs in the absence of the early secondary sexual characters. In such individuals organomegaly and hypertension are common findings. Prognathic mandible, frontal bossing, dental malocclusion and interdental spacing are the other features which may be seen in such individuals. Intraoral radiograph may show hypercementosis of the roots.

**Acromegaly**

Acromegaly derived from the Greek words "akros", extremities, and "megas", big. This term was proposed by Pierre Marie, a famous French neurologist working in La Salpetrière Hospital, in Paris, who published the first description of the disease and its pathology in 1886. It is used when the disease begins in adulthood. Acromegaly is characterized by an acquired progressive somatic disfigurement, mainly involving the face and extremities, but also many other organs, that are associated with systemic manifestations, with a prevalence of 40 to 70 cases per million inhabitants and an annual incidence of 3 to 4 new cases per million inhabitants. However, a recent study performed in Belgium suggests the prevalence of acromegaly may be more around 100–130 cases per million inhabitants. A very recent epidemiological study conducted in Germany showed even higher prevalence of acromegaly (1,043 per million). The disease is most often diagnosed in middle aged adult and affects both men and women equally.

This rare systemic disease, caused by a slow-developing tumor of the pituitary gland, induces changes in various vital organs. Among them is a change in occlusion that can bring the patient to the dentist first. Dental professionals may be the first health care providers to see the signs.

Craniofacial changes are characteristic of this disease and may involve facial skin, extraoral and intraoral soft and hard tissues. Thickening of the skin is due to deposition of glycosaminoglycan and increased collagen synthesis by the connective tissue. The lips become thick and negroid. The most characteristic craniofacial skeletal differences are protruded glabella and increased anterior face height. Mandibular prognathism and jaw thickening is due to deposition of periosteal bone in response to the excess growth hormone.

Other intraoral changes are spacing in the teeth, malocclusion, aperognathia, macroglossia, hypertrophy of palatal tissues which may cause or accentuate sleep apnea. Buccal tipping of the teeth due to enlarged tongue. Dental radiograph may demonstrate large pulp chambers (taurodontism) and excessive deposition of cementum on the roots. According to the morphologic analysis study conducted in Japan, Male patients tended to demonstrate downward mandibular advancement and crossbite, while females showed extension of the ascending ramus, downward displacement of mandible, bimaxillary alveolar protrusion, and edge-to-edge bite. The disease also has rheumatologic, cardiovascular, respiratory and metabolic consequences which determine its prognosis.
Conclusion:
Growth hormone is of vital importance for normal growth and development. Individuals with growth hormone deficiency results in a condition known as pituitary dwarf with disproportionate delayed growth of skull and facial skeleton giving them a small facial appearance for their age. And increase in growth hormone result in conditions known as gigantism and acromegaly. These all conditions are associated with changes with various vital organs. Among them are the changes in the oral cavity so the dental professional may be the first healthcare provider to come across such patients and may play an important role in diagnosing and treating such patients.

References:


