Review Article

Oral manifestations in growth hormone disorders

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ABSTRACT

Growth hormone is of vital importance for normal growth and development. Individuals with growth hormone deficiency develop pituitary dwarfism with disproportionate delayed growth of skull and facial skeleton giving them a small facial appearance for their age. Both hyper and hypopituitarism have a marked effect on development of oro-facial structures including eruption and shedding patterns of teeth, thus giving an opportunity to treating dental professionals to first see the signs and symptoms of these growth disorders and correctly diagnose the serious underlying disease.

Key words: Acromegaly, dwarfism, gigantism, growth hormone

Introduction

Growth hormone (GH) hypersecretion results in gigantism or acromegaly, a condition associated with significant morbidity and mortality, while GH deficiency results in dwarfism, growth retardation in children, and the GH-deficiency syndrome in adults.

This article aims at reviewing the various oro-facial and dental manifestations seen in pituitary gland disorder and highlights the need to diagnose such changes as earlier as possible so as to avoid associated medical complications and to reduce mortality and morbidity.

Table 1 highlights the important oro-facial and dental changes as observed in pituitary dwarfism, gigantism, and acromegaly

Hypopituitarism

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[1-4] with the permanent teeth showing a delayed pattern of eruption.[3,5] Often the shedding pattern of deciduous teeth

Table 1: Summary of oral manifestations of hypo- and hyperpituitarism

Hypopituitarism	Gigantism	Acromegaly
Delayed eruption rate as well as delayed shedding of deciduous teeth	Teeth size are proportional to generalized enlarged body size	Thick and negroid lips
Smaller clinical crown of teeth	Interdental spacing	Enlarged tongue (macroglossia) with indentations on lateral borders
Smaller roots with retarded growth of supporting apparatus	Dental malocclusion	Enlarged prognathic mandible (lantern jaw appearance)
Smaller dental arches	Hypercementosis of roots	Class III type of malocclusion
Crowding and malocclusion		Teeth are tipped to outside labial or buccal surface due to pressure exerted by tongue
Retarded growth of mandible		Increased periosteal bone formation
Fine wrinkles around mouth and eyes		Major salivary gland enlargememt
		Thickening and coarsening of facial skin
		Spacing in the teeth
		Enlarged nasal sinuses
		Anterior open bite

Access this article online	
Quick Response Code:	Website: www.ijem.in
	DOI: 10.4103/2230-8210.95678

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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. The complete absence of buds of the wisdom tooth even in the patient in fourth decade of life is also reported.[3,4] Other rare findings such as agenesis of the upper central incisor and solitary maxillary central incisor have been observed.[6,7] Amelogenesis imperfecta a diverse group of hereditary disorder that is characterized by defect in formation of tooth enamel has also been seen in the patient with reduced amount of growth hormone.[8]

In adult hypopituitarism, changes in the head include thin eye brows, loss of eyelashes, sharp features, thin lips, and immobile expression. No specific dental changes have been described in this condition.[1]

Hyperpituitarism

Gigantism and oral manifestations

Gigantism is the childhood version of growth hormone excess and is characterized by the general symmetrical overgrowth of the body parts.[2] 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.[1]

Acromegaly and oral manifestations

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.[9] The most typical clinical signs are the coarse facial features, large, spade shaped hands, and enlarged feet resulting from soft tissue swelling and bony enlargement.

This rare systemic disease 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 healthcare providers to see the signs.[10]

Craniofacial changes are characteristic of this disease and may involve facial skin, extraoral and intraoral soft and hard tissues.[11] Thickening of the skin is due to deposition of glycosaminoglycan and increased collagen synthesis by the connective tissue.[9] The lips become thick and negroid.[1,12] The most characteristic craniofacial skeletal differences are protruded glabella and increased anterior face height. Mandibular prognathism and jaw thickening are due to deposition of periosteal bone in response to the excess growth hormone.[9]

Other intraoral changes are spacing in the teeth,[12,13] malocclusion, aperthognathia,[14,15] macroglossia, hypertrophy of palatal tissues which may cause or accentuate sleep apnea,[12] buccal tipping of the teeth due to enlarged tongue.[1] 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.[16] The disease also has rheumatologic, cardiovascular, respiratory, and metabolic consequences which determine its prognosis.

Complications associated with hyperpituitarism

These oral manifestations of hyperpituitarism may give clues to underlying serious systemic problems, complications of which may include cardio-vascular complications like concentric biventricular hypertrophy or heart failures or respiratory complications like sleep apnea. Metabolic complications include impaired glucose intolerance due to growth hormone-induced insulin resistance and lipid abnormalities like hypertriglyceridemia. Muskuloskeletal complications and arthropathy along with other endocrinal disturbances including benign thyroid overgrowth, hypogonadism, and gonadal dysfunction may also be observed as associated complications.[17,18]

Role of Endocrinologist and Dentist

The oral cavity is an important anatomical location with a role in many critical physiologic processes, such as digestion, respiration, and speech. It is also unique for the presence of exposed hard tissue surrounded by mucosa. The mouth is frequently involved in conditions that affect the skin or other multiorgan diseases. In many instances, oral involvement precedes the appearance of other symptoms or lesions at other locations.

So it is very important for both endocrinologist and dentist to communicate with each other to order diagnostic tests, evaluate the results and create, administer and monitor treatment plans, and medications designed to address the problems.

Conclusion

As changes in the oral cavity may be presenting symptoms of pituitary disease, the dental professional may be the first healthcare provider to come across such patients. Thus the dental professional may play an important role in diagnosing and treating such patients.

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Cite this article as: Atreja G, Atreja SH, Jain N, Sukhija U. Oral manifestations in growth hormone disorders. Indian J Endocr Metab 2012;16:381-3.
Source of Support: Nil, **Conflict of Interest:** None declared.