



## ORAL AND DENTAL CHARACTERISTICS IN DOWN SYNDROME- AN OVERVIEW

## Dental Science

**Dr. Vijaylaxmi Madalli**

Reader, Department of Oral Medicine and Radiology, SDM College of Dental Sciences, Sattur, Dharwad. Karnataka-580009

**Dr. Atul Sattur**

Professor and Head, Department of Multispeciality, SDM College of Dental Sciences, Sattur, Dharwad, Karnataka- 580009.

## ABSTRACT

Down syndrome is a genetic disorder. It is known to be associated with chromosomal abnormality. It is also called as Trisomy 21. It affects 1 out of 600-700 live births. It elicits generalized decrease of growth as well as intellectual disability. There are varied craniofacial and oral manifestations of Down syndrome which include large and fissured tongue, arched palate, micrognathia, open bite, angular cheilitis, malocclusion, bruxism, low incidence of caries, spacing of teeth, delayed eruption, periodontal disease and dental anomalies. This article focuses on cranio-facial and oral manifestations of this disorder.

## KEYWORDS

Down syndrome, Trisomy 21, Syndrome, Craniofacial abnormalities, Oral manifestations

## Introduction:

Down syndrome is a genetic disorder. It is referred by various names such as Trisomy 21 or Trisomy G. It has an incidence of 1:800 to 1:1000 births.<sup>2</sup> In India the reported incidence of Down syndrome is about 1:700.<sup>3,4</sup> John Langdon Down in 1866, described characteristics of this syndrome. Down syndrome is an easily recognized, congenital, autosomal anomaly characterized by generalized growth and mental deficiency.<sup>5</sup>

Because of advances in medical treatment mean survival of patients with down syndrome has increased considerably.<sup>6</sup> It is essential for health care providers to improve quality of life of these patients.

## Craniofacial features:

General craniofacial features found in down syndrome patients are small nose, high arched palate, underdeveloped jaws, fissured tongue, cleft lip, incompetent lips, alteration in the eruption of primary and permanent dentition.<sup>7,8</sup> Brachycephaly is most common feature along with decrease in the size of frontal bone and paranasal sinuses leading to decrease in the size of sella turcica.<sup>9,10</sup> Tongue is abnormally large with anterior and low position in the mouth.<sup>10</sup> Down syndrome patients are mouth breathers, show muscular hypotonicity that causes problem in swallowing chewing and sucking.<sup>11,12</sup> Excessive salivation on labial commissure is also related to muscular hypotonicity and can lead to angular cheilitis and candidiasis.<sup>13</sup>

## Malocclusion:

Maxilla is smaller in size with lack of forward and downward development. Mandible is relatively large leading to class III malocclusion. The increased occurrence of class III malocclusion is attributed to smaller size maxilla, enlarged and abnormally positioned tongue and prognathic mandible.<sup>14,15</sup> There may be posterior cross bite on one or both sides with reversed incisor over jet. Majority of patients show tongue thrust and over 90% of patients have crossbites and both the genders are equally affected.<sup>16</sup> Majority of posterior crossbites are bilateral with anterior cross bites being the second largest and equal percentage of cases showing unilateral right or left sided crossbites. Anterior openbite has been observed more commonly than posterior open bite. Factors related to this finding may be deficient maxilla and presence of tongue thrust.<sup>17</sup>

## Dental Anomalies:

Dental anomalies are very common in patients with down syndrome. They are seen both in primary and permanent dentition.<sup>18</sup> Incidence is five times higher in these patients than general population. Most commonly observed anomalies are hypodontia, supernumerary teeth, hypoplasia, delayed eruption.<sup>19</sup> Hypodontia is prevalent in about 60% of down syndrome patients. Other anomalies seen are talons cup, peg shaped lateral incisors, taurodonts, amelogenesis imperfecta, dentinogenesis imperfecta, microdontia and macrodontia.<sup>19</sup>

## Dental caries:

Literature and researchers describe lower caries prevalence rate in down syndrome patients compared to normal population.<sup>20,21</sup> The reasons for this may be delayed eruption so they are exposed to caries' etiological factors for less time, bruxism (flatter occlusal surfaces facilitate self-cleaning), microdontic teeth and diastema allowing an early detection of caries, higher buffering capacity of saliva compared to normal population. Due to their complex medical condition they visit the dentist early in life (these children have several health problems and their parents seem to be easily warned of the oral risk factors).<sup>22</sup>

## Periodontal Disease:

Periodontitis is very common finding in Down syndrome. Manual dexterity difficulties lead to poor oral hygiene, debris accumulation, gingivitis and periodontal disease.<sup>23</sup> There is separation of the attached gingival margin with pocket formation and progressive loss of supporting bone. This continues with age, and the involvement of the mandibular incisors followed by the maxillary incisors and the latter much of the rest of the dental arches.<sup>24</sup> The increased rate of periodontal disease can be attributed to muscular hypotonicity, dento-alveolar joint laxity, lack of understanding of the needs of oral hygiene, impaired dexterity, compromised immune system, low T cells count and leukocyte dysfunction. Difficulty in gargling and swallowing, associated with a poor chewing ability reduces the natural teeth cleaning. Consequently, patients with this syndrome have halitosis, discomfort during chewing and early loss of permanent teeth.<sup>25</sup>

## Conclusion:

Patients with Down syndrome present with unique orofacial features, higher rate of malocclusion, periodontal disease and lower caries rate. When planning dental treatment for these patients dentists should take into consideration their general health in order to achieve holistic approach.

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