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## REVIEW ARTICLE

### EPHEBODONTICS - A REVIEW

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#### ABSTRACT

Ephebodontics or adolescent dentistry is the science of dentistry that deals with the children who are in the process of growing up from childhood to manhood. Ephebos is a Greek noun which means youth entering manhood and is derived from the word ephebodontics. The word ephebodontics was first coined in Dental Clinics of North America, April 1969 issue. Adolescence is considered as an in between age in our society, which brings about lot of mental as well physical changes in the life of the individuals. The dental changes as well as the dental health needs of this age group are very important but are often neglected. Hence the role of dentists is very vital for understanding the requirements and the treatment needs of the adolescents. This review is based on the importance of adolescent dentistry and the ways in which dentists can have a vital role in treating adolescents.

#### INTRODUCTION

The word "adolescence" originates from the Latin word "adolescere", which is composed of "ad" (to) "oleve" (to grow) or "olere (to nourish). The term teenager is more often used than the word adolescent.<sup>1</sup>The adolescent finds himself in a constant tension to identify himself. Most of the adolescents find it difficult to cope up with the mental and physical changes that they undergo during their adolescent period. Proper parental guidance as well as guidance from teachers are necessary for them. The dental needs of adolescents differ largely from other age groups. The physical, emotional and psychological changes in adolescents require specific health care. When we consider dental health we observe increased caries activity and compromised periodontal health. The reasons attributed to this include dietary pattern, neglected oral health care, malocclusion, and traumatic injuries. The dental health concerns are greatly influenced by esthetics, habits, and behavioral considerations. Many other factors include the income of the parents and their perception of oral health care needs play a major role in determining the quality of dental care received by the adolescent.<sup>2</sup> Adolescence represents a relatively long period of life in our society. The dentist must be capable enough in understanding the different characteristics of adolescents and the dental treatment needs of this age group.

The dentist must be conscious and very much careful in handling this age group patients. Adolescence is the time in which a parent's role in the child's home dental care must to be minimized, and the importance of managing his or her own oral health must be emphasized. Some adolescents are able to do this easily and seem to be motivated to practice proper oral hygiene on a day by day basis. However, there are certainly exceptions, and some of these exceptions can be stubborn. The dentist must play a role in educating and motivating such patients, for not only caries problem but also periodontal disease and its unfortunate implications become increasingly important as the child proceeds to the later years of adolescence. Adolescence is also a time very likely to impose on a child stressful life situations and anxiety regarding social circumstances. These, paired with fatigue, a poor diet, and increasing responsibilities at school and in life in general, may create enough stress to bring about the onset of certain stress-related oral diseases, such as necrotizing ulcerative gingivitis.<sup>3</sup> A study carried out in Brazil in 2009 showed that gingivitis was prevalent among its adolescent population and also restorative dental services were lacking for this population.<sup>4</sup> This clearly showed that people are unaware about the importance of the dental treatment needs of this age group. The importance of need for oral health care is the most common unmet health care need among and adolescents.

**Need for special attention for adolescents:** Dentists who work with adolescents must know what is normal and what characterizes as early or late physical development in order

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to prepare the adolescent for the myriad of changes that take place during this phase of life.<sup>5</sup> For example, girls maturing early are found to be at a higher risk for mental depression, substance abuse, disruptive behaviors and eating disorders. In the same way boys maturing early are found to be more likely to be associated with high-risk behaviors such as sexual activity, smoking or delinquency.<sup>6-7</sup> Parents should be made aware that adolescent autonomy must be associated with the teen's chronological age, social and emotional development but not to the level of physical development whether early on time or late. All adolescents should learn to master the emotional skills necessary to handle stress, be sensitive and socialize well with other people. These skills are called "emotional intelligence".<sup>8</sup> Emotional intelligence comprises of self-awareness but above all relationship skills for building the ability to get along with other people and to make friends.

For the sake of achieving a greater independence from their parents, adolescents tend to focus themselves towards their peers more extensively than they had to in the earlier stages of development. The professionals whose job is to advise parents can help to reassure them that increased contact with peers among adolescents do not mean that parents are seen as less important but that their new focus on peers is an important and healthy new phase in their child's development. Younger adolescents most likely have at least one primary peer group with whom they identify themselves being similar to its members in many aspects.<sup>9-10</sup> Professionals who can help adolescents in developing emotional intelligence may provide them with resources which will help them to succeed as adults in both personal as well as professional life.<sup>8</sup> Youth who lack social skills and also develop aggressive behaviors are most likely in need of professional help to manage their aggressive and disruptive behavior.<sup>11</sup>

**Need for adolescent dentistry:** Along with physical, emotional and psychological changes seen in the adolescents, a lot of oral changes are also seen during this period. Periodontal problems has its origin in adolescence and occurrence dental caries also increases during this time. Facial growth along with transition from primary to permanent dentition also occurs during this time. Behavioral changes related to sex, peers and authority make dental management challenging. Restorative and esthetic concerns, its consent and diet management are also affected by this transitional period in a child's life.

**Oral cavity changes:** Growth of the facial structures tend to follow the general body growth curve, especially standing height. Adolescence is considered as a critical period for orthodontic diagnosis and correction because of the rapid growth of the face, especially the mandible.<sup>12</sup> According to Sassouni and Forrest the mandible grows downward and anteroposteriorly, the maxilla attains its adult size, remodeling of the frontal sinuses occur and the cranial base continues to grow along the spheno-occipital synchondrosis during the age of 12-16 years. Apart from this combination of events the growth of the mandible occurs in spurts and is often irregular in amount and duration. Orthodontic therapy does not seem to influence the time of maximum facial growth.<sup>13</sup>

**Dental Caries In Adolescents:** It is a multifactorial infectious disease characterized by demineralization of the inorganic components and destruction of the organic substances of the teeth. It is expressed during a certain period of time as an accumulative demineralization of the calcified structure which, if not treated has the potential for causing cavities in the enamel along with collateral damage to dentine and pulpal tissues.<sup>15</sup> Barbato and Peres stated that in the prevalence of tooth loss, 92.7% of the cases were due to dental caries that were not prevented or treated.<sup>14</sup> Prevention of dental caries in children and adolescents require a range of individual and population level strategies such as community fluoridation of water, topical fluoride application (e.g., fluoride toothpaste, fluoride varnish, and fluoride mouth rinse), cavity sealants, education, and dietary interventions.

**Gingivitis:** Gingivitis is associated with the inflammation of gingival tissues with no attachment or bone loss. Puberty gingivitis has been recognized by some authors and others have discounted it as an identifiable entity. Baer considers this term to be a misnomer as it suggests that a hormonal imbalance as the etiologic factor. Hormones may play a role but so do the local irritants such as plaque. The data on periodontal infection in adolescents, cited earlier, points towards the origin of gingival problems sometime in adolescence. In a longitudinal study by Sutcliffe on gingivitis and puberty in adolescents (11-17 years of age) found that gingivitis tend to peak and then go on a decline during the 6-years period and also that the peak periods of poor oral hygiene did not correlate significantly with the peak periods of gingivitis. His data suggested a heightened tissue response at this period.<sup>28</sup> Younger children tend to have less plaque accumulation than adults and appear to be less responsive to equal amount of plaque.<sup>4</sup> This can be explained by both differences in composition of bacteria in plaque and by difference in the nature of inflammatory response. The prevalence of puberty-associated gingivitis peaks at the age 10 in girls and age 13 in boys.<sup>3</sup>

Long-standing gingival disease in young individuals sometimes results in the occurrence of chronic inflammatory gingival enlargement, which can be generalized or localized. Inflammatory gingival enlargement often resolves on its own when adequate plaque control is established. If the tissues have undergone fibrotic changes then gingivectomy is often required. Long-term administration of certain systemic medications can induce an overgrowth of gingival tissues. It can precipitate after the use of anticonvulsant- phenytoin (Dilantin), the immunosuppressant- cyclosporine or a calcium channel blockers. Drug-induced gingival enlargement develops slowly and may resolve to some extent if the medication is stopped. A genetic component is also suspected towards the susceptibility to gingival enlargement.<sup>3</sup>

**Periodontitis:** Significant loss of periodontal attachment is common in adults, with chronic periodontitis (formerly called "adult onset" periodontitis) affecting the majority of the population. The number and severity of affected sites increase steadily with age, demonstrating that chronic periodontitis often begins in adolescence. Chronic periodontitis responds to oral hygiene measures and can more easily be arrested in its early stages when attachment loss is minimal and deep pockets have not developed.

Smoking is considered as a major risk factor of periodontitis and smoking is increasing among adolescents, particularly females. Smoking status should be determined as part of a periodontal assessment for young patients and appropriate counseling provided.<sup>13</sup>

### AGGRESSIVE PERIODONTITIS

Rapidly progressing forms of periodontitis also affect children and adolescents. Both periodontitis as a manifestation of systemic disease and aggressive form of periodontitis affecting children who are otherwise healthy occur in the pediatric population. Because of their rarity, it has been difficult to study these diseases.<sup>13</sup>

### LOCALIZED AGGRESSIVE PERIODONTITIS

Localized aggressive periodontitis (LAP), formerly known as localized juvenile periodontitis is characterized by attachment and bone loss around the permanent incisor region and first permanent molar region. The disease is usually detected in early adolescence, but retrospective examination of earlier radiographs has sometimes revealed undetected disease in the primary dentition. LAP is clearly associated with the presence of high quantity of *Aggregatibacter actinomycetemcomitans*, and successful treatment outcomes correlate well with reduction in the number of bacteria. Its treatment consists of local therapeutic measures in conjunction with systemic use of antibiotics and microbiological monitoring.

### GENERALIZED AGGRESSIVE PERIODONTITIS

Generalized aggressive periodontitis (GAP) is seen to occur in adolescents and teenagers sometimes. In young adults the same disease was formerly called rapidly progressive periodontitis. Unlike LAP, GAP mostly affect the whole dentition and is not self-limiting. GAP is sometimes associated with high levels of *A. actinomycetemcomitans* seen in LAP or has a microbiological profile closer to that of chronic disease with *P. gingivalis* and *Prevotella intermedia*.<sup>13</sup>

### NECROTIZING ULCERATIVE GINGIVITIS/ PERIODONTITIS

NUG/NUP is characterized by a sudden onset of painful gingival inflammation along with interproximal and marginal tissue necrosis and ulceration. Malnutrition, viral infections, stress, lack of sleep, and smoking have been reported as the etiological factors. Necrotizing ulcerative gingivitis/periodontitis is most commonly associated with high titers of spirochetes and also *Prevotella intermedia*. Local debridement usually produces rapid resolution of the disease but if it is associated with pyorrhea then immediate antibiotic therapy with penicillin and/or metronidazole is indicated.<sup>3</sup>

### Deleterious Habits

**Smoking Issues, Drugs and Alcohol:** Frequent users of smokeless tobacco have an increased risk of developing localized gingival recession, white lesions (leukoplakia) and oral cancer. Although long term exposure is usually necessary to produce malignancy, white lesions and to a lesser degree gingival recession which is common in teenage

users.<sup>14</sup> A study done in Brazil by Monalisa et al found that the most cited health consequences of smoking were cancer and cardiopulmonary problems, which were indeed strongly associated to this habit. But the adolescents demonstrated a lack of knowledge on these aspects.<sup>15</sup> Peer pressure is the main reason behind the smoking issues. Another important reason is that children often tend to imitate elders and practice habit of smoking. The usage of alcohol and drugs by teenagers is also very commonly observed to get rid of anxiety and depression. Therefore proper monitoring of the youth by the elders is very much essential during this period.

**Disordered eating:** Anorexia and bulimia are the main eating disorders seen in this age group. Especially the girls are conscious about their appearance and in order to maintain a slim body, tend to diet obsessively. In general, if we observe we notice that a lot of teenagers are addicted to junk foods and carbonated drinks, which subsequently harm their general health as well as oral health. The problem with this age group is that in spite of constant advice from the elders they do not change their eating habits. Dentists should counsel the parents as well as the children, regarding the dental and physical risks associated with excessive consumption of sweetened carbonated drinks.

**Trauma:** Trauma is a very common issue seen among children and adolescents. Appropriate dental treatments should be given at the right time to protect the structures of the oral cavity following any injury. Mouth guards serve as a very useful protective wear especially for athletes, who are always prone to injuries. Helmets and facemasks have also proved effective in reducing the frequency and severity of traumatic craniofacial and intraoral injuries.

**Importance of Dentists:** Parents are unaware of the oral cavity changes that occur during the adolescent period. In most cases, the only manifestations seen by using smokeless tobacco are oral changes. So dentists must make it a habit to record the proper health history of the patients, which includes questions regarding different forms of tobacco use. The presence of soft tissue changes, including gingival recession and leukoplakia should be documented and monitored. Patients with oral lesions should be advised to discontinue the habit and referred to a tobacco cessation program if one is available. Once use is discontinued, leukoplakic lesions usually disappear within a week or two. If lesions persist as long as a month after discontinuation of the habit, a biopsy should be performed. Counseling should be given to the patients.<sup>13</sup> The adolescence period is a crucial time period, because the children of this age group are often rebellious. Regular dental visits are very much essential during the adolescent period. During these visits, the dentists can enlighten the adolescents regarding the importance of maintaining a proper oral hygiene and also about the harmful deleterious habits that are to be avoided. Since the skeletal and dental changes of the face occurs during this period, if the problems are diagnosed early, prompt treatment and corrections of the anomalies can be done. Dentists can also help greatly in the behavior management of the adolescents.

### DISCUSSION

The period of adolescence is considered very important because this period shapes the character of the children as they grow up to become individuals of different behavior.

Adolescents often engage in risky and harmful behaviors. One theory emphasizes on the need for excitement, fun and novel, intense sensations that can override the potential risks involved in a particular activity. Another hypothesis stresses that majority of the risky activities occur as a group and involves peer acceptance and status in the group.<sup>16</sup> When high-risk behaviors begin early such as at the age of 8 or 9, that are ongoing rather than occasional and usually occur in a social group of peers who are engaged in the same activities more concern is warranted. In such cases attention should be given to refer the adolescent and his/her family to a mental health professional as soon as possible. It is a clear sign that the adolescent is in serious trouble and require professional assistance if he/she is engaged in many such risky activities.<sup>17.</sup>

It is not easy to draw a line between teens who are simply experimenting with alcohol and drugs and teens who have developed an alcohol or drug addiction. This judgment can only be made by a trained substance abuse professional. Teens who begin drug abuse early, who depend on alcohol and drugs to overcome anxiety or depression (self-medicate), who share alcohol or drugs among friends as a group will be at a higher risk for developing a substance abuse crisis.<sup>18</sup> In a cross sectional study carried out by Monalisa da Nobrega Cesarino Gomes et al in Brazil to determine the prevalence of tobacco smoking and alcohol, it was found that the prevalence of alcohol usage was high compared to that smoking in the age group of 10 to 19 years and common consequences cited were cancer and cardiopulmonary problems.<sup>15</sup> It was also seen in the study conducted by Paulo Robert et al that smoking was also one of the reasons for early tooth loss.<sup>9</sup> It should be noted that counseling should be given to children by elders or trained medical professionals in order to stop such habits. Gingivitis which is mainly characterized by the inflammation of the gingiva occurs in the adolescent group mainly due to lack of maintenance of good oral hygiene. In the study conducted by Maria Augusta et al in Brazil, gingival index (Loe & Silness) was employed to categorize gingivitis and bleeding on probing was checked for the study participants, aged 15 to 19 years. It was observed that gingival bleeding on probing was present in more than half of the students.<sup>4</sup>

Adolescence is a period where significant caries activity is seen among many individuals. Latest research points out that even though the overall caries rate is declining it still remains high during adolescence. In a study by Skaret. E et al to know the factors associated with severe untreated tooth caries in rural adolescents aged 12-20 years, it was found that lack of knowledge regarding own dental health status and mother's dental health, misbeliefs about the dentist, unwillingness to go to a dentist even after having severe problems, not being a part of any club or playing in any sports team and not having a close best friend were the major factors responsible for caries among adolescents.<sup>20</sup> Study done by Jose. O. Garcia et al in Mexico also showed that increased dental caries prevalence and severity among the observed samples of adolescents and young adults.<sup>21</sup> Another study done by Angela Xavier et al showed there was a higher prevalence of caries in adolescents who used public oral health services rather than private ones; indicating poor oral health among the participants having lower quality of life.<sup>22</sup> During the adolescence period we observe a change in the dental and skeletal structures of the face. Sometimes the change is acceptable, but if the changes are not in a preferred

manner, then orthodontic treatment is necessary. The study done by Heikinheimo et al showed that between the age of 12 and 15 years occlusal interferences and signs of craniomandibular disorder were quiet common.<sup>25</sup> It is essential to establish the growth or developmental status of the patient in order to plan sensible treatment.<sup>24</sup> Puberty is associated with weight gain and girl as well as boys starts becoming conscious about their changing body shapes. A minor portion of these adolescents gradually develop eating disorders such as anorexia nervosa or bulimia.<sup>25</sup> The study done by Subramaniam P et al showed that children from the upper classes consumed more food, including snacks and other high calorie diet, were at a risk of overweight when BMI was calculated.<sup>26</sup> Dental trauma is very commonly observed during adolescent period. Following any dental trauma, aesthetic correction is inevitable. A systematic meta-analytical review was done by Saber Azami Agdash et al showed that a relatively high prevalence of dental trauma among youngsters, which calls for an effective planning and intervention to prevent the occurrence among children and adolescents.<sup>27</sup> Dentists possess a great challenge in managing the adolescent age group. Proper oral hygiene instructions and dietary guidelines must be given to them. Moreover the dentists must be efficient enough in convincing the adolescents to have their regular dental checkup.

## Conclusion

Adolescence is considered as a transformational phase. During this phase physical changes, alterations in the attitude and self-perception take place but the adolescent's ability to cope and adapt with these changes often decline during this phase. So proper guidance and monitoring of the budding children by the elders during this period is necessary. Peer influence also play a vital role in the lives of children and hence it should be monitored. The oral health needs of adolescents and their treatment should be well identified by the dentists. Each dentist should incorporate specific ephebodontic protocols for the treatment and management of adolescents.

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