Diagnosis of Periodontal disease in adolescents.
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Abstract:
Periodontal diseases affect the adolescents in the form of Gingivitis and incipient form of Chronic Periodontitis and Aggressive Periodontitis. The Incipient Periodontitis is often not diagnosed by clinicians for the lack of understanding of the disease and sufficient diagnostic acumen. When the disease is diagnosed, be it Chronic Periodontitis or Aggressive Periodontitis, the tissue damage may be evident. The periodontal diseases can be treated successfully by appropriate interventions and more importantly they are preventable. Early treatment signifies predictable and definite outcome.

Keywords: Periodontal diseases, adolescent, diagnosis, incipient

Introduction:
Adolescence is the transitional stage of physical and mental human development generally occurring between puberty and adulthood. A huge proportion of world’s population – more than 1.75 billion is young, aged between 10 to 24 years. One in every five people in the world is an adolescent and 85% of them live in developing countries. India has the second most population in the world and adolescents form about 30 percent of total population of India. Many serious diseases in adulthood have their roots in adolescence for example tobacco use, sexually transmitted infections, poor eating and exercise habits, mental health problems, leading to illness or premature death. Chronic Periodontitis similarly can have its initiation during adolescence and can later in life lead to tooth loss and associated systemic diseases.

A decade back the American Academy of Periodontology (AAP) accepted that periodontal disease is not limited to adult population only. It can affect all ages and accordingly made amendments to its classification of Adult Periodontitis to Chronic Periodontitis[1]. There is epidemiological evidence that periodontal disease can have its initiation in childhood[2,3]. Gingivitis of varying severity is nearly universal in children and adolescents[4]. Periodontal disease shows an increase in level during puberty.

The early adolescents are possessed by narcissistic attitudes and after puberty there is a sudden decline in inflammatory processes in gingiva. A number of studies have highlighted the surprisingly high prevalence of subgingival calculus in young subjects[5]. Fig.1 shows the presence of calculus in an adolescent.

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The microflora in puberty shows an increase in proportion of gram negative anaerobes, and percentage of Prevotella intermedia, Capnocytophaga and Eikenella corrodens is higher. There is increase in Actinobacillus actinomycetemcomitans and Porphyromonas gingivalis in post pubertal age \[6,7\]. Smoking habit in adolescents can lead to periodontal disease in young adults. In a study, smokers aged 19-30 years were 3.8 times more likely to have periodontitis as compared to non smokers\[8\]. Moreover, there may be a genetic predisposition to periodontitis in an individual making him more susceptible to disease.

Periodontal disease affecting adolescents may be Gingivitis, Aggressive periodontitis, Incipient Chronic periodontitis and periodontitis associated with systemic diseases. Certain systemic conditions have been associated with periodontal destruction in adolescents like Papillon-lefevre Syndrome, Down’s syndrome, Hypophosphatasia, leukocyte disorders and Ehlers-Danlos Syndrome. Gingivitis can progress to incipient adult periodontitis in a sizable proportion of adolescents. In a study conducted at Bahadurgarh on 329 dental students in the age group 17-22 years, 19.1% students showed clinical signs of periodontal disease and 6.3% had cemento-enamel junction (CEJ) to bone crest distance of ≥ 2 mm on radiographs\[9\].

**Diagnostic tools:**

Periodontal probe is the most important diagnostic tool clinically used to assess periodontal pocket depth and clinical attachment level. The appropriate method of periodontal probing is shown in Fig. 2. After assessment of periodontal pocket, it is important to ascertain the presence of clinical attachment loss (CAL) as this will determine the presence of a pseudopocket or a true periodontal pocket.

Computerized periodontal probe (Florida probe) is a more sophisticated and advanced method. Many chair side diagnostic kits based on crevicular fluid estimate and analyses are available (Perioscan, Periocheck, Pocketwatch, Prognostik etc). Perioscan requires a plaque sample to detect the presence of enzymes capable of degrading N-benzoyl-DL-arginine-2-naphthylamide (BANA) from relatively few anaerobic periodontal pathogens. Periocheck assays the presence of neutral proteases in crevicular fluid. All these armamentarium can be used to arrive at the diagnosis.

Radiographically, the measurement of cementoenamel junction to bone crest of 2 mm or more is an appropriate cut off point for bone loss\[11\]. Minor changes in radiographs like the bone loss and density at crestal margins also are suggestive of disease. Variation in angulation and overlapping roots can pose difficulty in interpretation. Loss of cortical density and a rounding of junction between alveolar crest and lamina dura are the findings seen in initial periodontal disease. Fig-3, (A-D) shows radiographs of adolescents with incipient bone loss.
**Diagnostic criteria:**

The diagnostic criteria of Incipient Chronic Periodontitis include the findings of attachment loss 1 to 2 mm, horizontal pattern of bone loss and marginal bone loss: CEJ to alveolar crest distance greater than 2mm.

The diagnostic criteria of Aggressive Periodontitis include attachment loss greater than 3mm. In localized form first molar (s) and incisor (s) are affected and upto 1 or 2 more teeth may be involved. In generalized form at least three teeth other than first molars and incisors must be affected. There is severe bone loss. In localized form the molar–incisor regions show arc shaped lesions and angular defects. In generalized form there is more generalized bone loss (Fig-4, A-D). Along with these features, a weak association between presence of subgingival calculus, gingival inflammation and subsequent loss of attachment has been observed. However, the incipient lesions of aggressive periodontitis in adolescents show signs of bone loss in molar-incisors or more generalized affliction.

Diagnosis for adolescent group requires precision. If the disease goes unnoticed, undiagnosed and uninterrupted at this stage, it can cause periodontal disease in adulthood. Fig-4 (A-D) shows radiographs of young adults with extensive bone loss. The Incipient form of Chronic Periodontitis and Aggressive Periodontitis can be treated successfully by appropriate intervention.

**Fig-3(A-D) Radiographs showing incipient bone loss in adolescents.**

**Fig-4 A, 22 year old female**
Figs 4 (A-D) Radiographs showing severe bone loss in Generalized Aggressive Periodontitis.

References:


