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Original Research Paper

Gingival Diseases in Children – A Literature Review

Dental Science

KEYWORDS :

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ABSTRACT

An attractive smile is the one that has both harmonious correlations between the shape and colours of the teeth and a good proportion between lip and gingiva. When it comes to children, it becomes more important because now a days children are more aware of their surroundings and are very conscious about their appearance and smile. Children and adolescents are subject to a wide variety of gingival infections. Epidemiological studies indicate that gingivitis of varying severity is nearly a universal finding in children and adolescents. Gingivitis and periodontitis are considered to be a continuous process of inflammation that leads to periodontal diseases. The prevalence of gingivitis in developed countries was about 73% among the children between 6 and 11 years of age. Paediatric dentist have an important role to play in the early recognition and diagnosis of gingival and periodontal diseases. Hence, is to review the current literature enlightens about the gingival diseases and importance of long term overall oral health maintenance in childhood.

INTRODUCTION:

The perspective of many patient's 'healthy' periodontium is the one that is comfortable and free from aesthetics and phonetics problems, and gingiva and periodontium plays a major role.1 Gingiva is a part of the soft tissue lining of the mouth which is closely adapted to the necks of the teeth and also covers the bone holding the roots of the teeth. Healthy gingiva is usually coral pink, containing normal physiologic pigmentation. The term periodontium arises from the Greek word peri meaning around, and odont meaning tooth, these are "tissues investing and supporting the teeth" that comprises root cementum, periodontal ligament, alveolar bone and the part of the gingiva facing the tooth.2 The prevalence of gingivitis in developed countries was about 73% among the children between 6 and 11 years of age. Paediatric dentist have an important role to play in the early recognition and diagnosis of gingival and periodontal diseases.3 This is to review the current literature concerning the most common gingival diseases in children.

Anatomy

Structure	Primary teeth	Permanent teeth
Marginal gingiva	Gingival sulcus Sulcus depth more free gingival margin Thicker and rounder Flaccid Increased retractability	Gingival sulcus Sulcus depth less free gingival margin Knife edged Not flaccid Decreased retractability
Attached gingiva	Less keratinized epithelium Increased vascularity Less dense Appears red Less stippling seen Interdental cleft Retrocuspid papilla	More keratinized epithelium Decreased vascularity More dense Appears less darker No stippling present Absence of interdental cleft and retrocuspid papilla
Papillary gingiva	Interdental saddle areas	Interdental col areas
Periodontal ligament	Wider space Fewer fibers More vascular	Less wider More fibers Less vascular
Alveolar mucosa	Redder	Less redder / darker
Alveolar bone	Less calcified More vascular Fewer but thick trabeculae Larger marrow spaces Thin lamina dura Flat interdental crests	More calcified Less vascular More and thin trabeculae Narrower marrow spaces Thick lamina dura Sharp interdental crests
Cementum	Thin	Thick [4]

CLASSIFICATION OF GINGIVAL DISEASES

A. Plaque-induced gingival diseases

B. Non-plaque-induced gingival lesions

Dental plaque induced gingival diseases

- Plaque induced gingivitis
- Plaque induced with local contributing factor
- Necrotizing ulcerative gingivitis
- Puberty associated gingivitis
- Menstrual cycle associated gingivitis
- Pregnancy associated gingivitis
- Pregnancy associated pyogenic granuloma
- Diabetes mellitus associated gingivitis
- Leukemia associated gingivitis
- Drug induced gingival enlargement
- Oral contraceptive associated gingivitis
- Ascorbic acid deficiency gingivitis

Non plaque - induced gingival lesions

- Neisseria gonorrhoea - associated lesion
- Treponema pallidium - associated lesion
- Streptococcal species associated lesion
- Mycobacterium tuberculosis associated lesion
- Bacillary angiomatosis
- Primary herpetic gingivostomatitis
- Recurrent oral herpes
- Varicella zoster infection
- Generalized gingival candidiasis
- Linear gingival erythema
- Histoplasmosis
- Hereditary gingival fibromatosis
- Gingival manifestations
- Lichen planus
- Mucous membrane pemphigoid
- Pemphigus vulgaris
- Erythema multiforme
- Lupus erythematous

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- Linear IgA disease
- Wegener's granulomatosis
- Psoriasis

Allergic reactions to the gingiva
- Toothpastes
- Mouth rinses
- Chewing gum additives
- Food and food additives

Traumatic lesions of gingiva
- Chemical injury
- Physical injury
- Thermal injury 5

GINGIVAL DISEASES AND ITS MANAGEMENT

Gingival problems, either in acute or chronic nature are nearly universal among children and adolescents. There is growing acceptance that gingivitis is not a single disease, but an assortment of diseases that are the end result of a variety of different processes.6Although the microbiological picture of gingivitis in children and adolescents has not been completely characterized, certain bacterial species have been found in experimental studies. Those species were aggregatibacter (Actinobacillus) species Capnocytophaga species, Leptotrichia species and Selenomonas species.2

PLAQUE INDUCED GINGIVITIS

It is defined as inflammation of the gingiva in the absence of clinical attachment loss. Plaque-induced gingivitis begins at the gingival margin and can spread throughout the remaining gingival unit.7

Management

The therapeutic goal is to establish gingival health through the elimination of the etiologic factors; e.g., plaque, calculus, and other plaque-retentive factors. Contributing systemic risk factors may affect treatment and therapeutic outcomes for plaque-induced gingivitis. These may include diabetes and certain periodontal bacteria, aging, gender, genetic predisposition, systemic diseases and conditions (immunosuppression), nutrition, pregnancy, HIV infection, and medications. A treatment plan for active therapy should be developed that may include:

- Patient education and customized oral hygiene instruction.
- Debridement of tooth surfaces to remove supra and sub gingival plaque and calculus.
- Antimicrobial and antiplaque agents or devices
- In selected cases, surgical correction of gingival deformities that hinder the patient's ability to perform adequate plaque control may be indicated.8

ACUTE NECROTIZING ULCERATIVE GINGIVITIS

Acute Necrotizing Ulcerative Gingivitis (ANUG) is an acute infection of the gingiva. It is otherwise known as Vincent's disease. Young people under stress, having poor oral hygiene, or suffering from malnutrition, are at risk of acute necrotizing ulcerative gingivitis. This disease starts with necrotic lesions at one or more interdental gingival papillae and progresses to its maximal extent within a few days. This disease associated with pain, bleeding, fetor ex ore and occasionally, fever and malaise.9

These lesions consist of four zones, the outer surface of the lesion, the bacterial zone, contains a variety of bacteria and may resemble the sub gingival microbiota of periodontal lesions. The neutrophils zone rich in leukocytes and underscores the acute state of the disease. The necrotic zone contains cell debris as well as spirochetes and gram negative rods. The invasion zone exhibits infiltration of large and medium-sized spirochetes into apparently normal gingival connective tissue. Selective spirochetal invasion of underlying gingival connective tissue is unique to ANUG lesions.10

Management

Treatment of ANUG involves mechanical debridement of the affected sites and institution of oral hygiene measures. Oral rinses with chlorhexidine may be beneficial. Patients with fever or other systemic manifestations may receive systemic metronidazole or other anti-microbial therapy effective against anaerobes.11

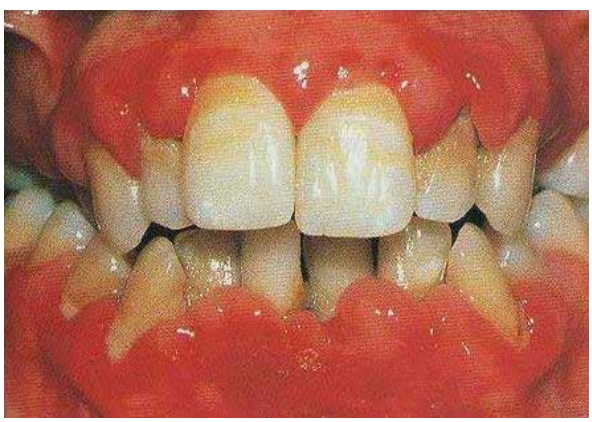
Patient counselling should include instruction on proper nutrition, oral care, appropriate fluid intake, and smoking cessation. A comprehensive periodontal evaluation should follow resolution of the acute condition. The desired outcome of therapy in patients with acute necrotizing periodontal diseases should be the resolution of signs and symptoms and the restoration of gingival health and function.12

PUBERTY ASSOCIATED GINGIVITIS

Pubertal gingivitis which is also called steroid hormone related gingivitis is defined as exacerbation of gingivitis by fluctuation in gonadotrophic hormone levels during puberty. The most prevalent type of gingival disease in childhood is known as chronic marginal gingivitis or puberty gingivitis.13

Management
In cases of puberty gingivitis, it is best to control the condition as soon as it is noticed to avoid further periodontal problems from developing. Periodontal therapy is advisable, which includes scaling and root planning procedures. Mouthwashes containing chlorhexidine can be used to reduce the infection. Patients suffering from puberty gingivitis should maintain a strict protocol for good oral hygiene maintenance. Adolescents should spend more time in preventing the accumulation of dental plaque by practicing good oral hygiene. It is advisable to brush at least twice a day, using proper brushing techniques for three minutes at a time. The interdental plaque should be removed using dental floss.14

DIABETES ASSOCIATED WITH GINGIVITIS
Gingival disease is the most prevalent oral complication in Insulin Dependent Diabetes Mellitus (IDDM) and Non-Insulin Dependent Diabetes Mellitus (NIDDM) patients and has been labelled the "sixth complication of diabetes mellitus".



Management
The chances of complications are more in poorly controlled or uncontrolled diabetics than in controlled diabetes. It has been observed that contain granulocyte abnormalities like phagocytosis improved with better diabetes control. It has been shown that glycaemic control reduces the incidence of complications. There are more chances of infection in uncontrolled diabetics than in controlled diabetics. Hyperglycaemia triggers a chain of events which result in the risk of infection and delayed healing. It has been shown that uncontrolled diabetics have more bone loss, severe bleeding, and severe periodontal disease than controlled individuals.15 The effect of periodontal therapy in diabetics found that there was reduction in patients who underwent periodontal therapy with systemic doxycycline and chlorhexidine rinse. The removal of pathogens by treatment leads to a decrease of inflammation, which in turn reduces insulin resistance; this in turn reduces the sugar level. The absence of inflammation causes a decrease in adrenaline level, which in turn regulates anti-insulin action, leading to decrease in sugar level. These facts together lead to an overall reduction in the dosage of insulin or oral hypoglycaemic drugs.16

LEUKEMIA ASSOCIATED GINGIVITIS
Leukemia is a malignant haematological disorder characterized by an abnormal increase in white blood cells and proliferation and development of leukocytes in the blood and bone marrow. Leukemia is classified according to its duration and the type of cell involved and the number of the cells in the blood. There are noticeable correlations of leukemias with age. Acute lymphoblastic leukemia constitutes 80% of all childhood leukemias, whereas acute myelogenous leukemia usually affects adults.17

Management
The treatment is based on plaque control and, sometimes, on oral antibiotics administered one day before and one day after mechanical debridement.8

DRUG INDUCED GINGIVAL ENLARGEMENT
Overgrowth of gingiva is a well-recognized unwanted effect of a number of drugs. The most frequently implicated are phenytoin, cyclosporine and nefidipine. Interdental papillae become nodular before enlarging more diffusely to encroach upon the labial tissues. The anterior part of the mouth is most severely and frequently involved.18

Management
Treatment of drug-induced gingival overgrowth includes surgical and non-surgical therapies. Non-surgical treatment, where it is possible, is based on the interruption, modification of the dosage or replacement of the drugs. In patients treated with cyclosporine, it seems that the contemporary use of the antibiotic azithromycin may decrease the severity of gingival overgrowth.8

GINGIVAL ABSCESS
Gingival abscesses usually arise from an insult such as trauma caused by food which forces bacteria into the tissue. Within hours, a bright red gingival swelling will convert to the lesion that is pointed and fluctuant mass from which purulent exudate may be expressed. The lesion is generally self-limiting, ultimately rupturing if permitted to progress. The gingival abscess should not be confused with the periodontal abscess, which affects the supporting periodontal structures.17

Management
The goal of therapy for a gingival abscess is the elimination of the acute signs and symptoms as soon as possible. The

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first step of treatment is to drain all pus that has accumulated in the abscess. One way to accomplish the drainage is to pass a probe into the abscess and to gently scrape away the infected material. It may be necessary to make a small incision in the gums in order to reach the abscess. If the abscess has not progressed into the periodontal structure, antibiotic therapy is usually effective in eliminating the infection. 19

VIRAL INFECTIONS

The most common viral infections are herpes simplex virus type1

(HSV-1) and 2 (HSV-2) and varicella-zoster virus.

HSV is the most common viral infection of the oral/facial area. It has two subtypes:

Type 1, which affects the oral cavity; and

Type 2, which affects the genitals.

ACUTE HERPATIC GINGIVOSTOMATITIS

It is an acute viral infection (herpes simplex) of the oral mucosa. The herpes simplex virus produces some of the most common acute infections in humans. Two herpes simplex virus serotypes, type 1 is responsible for most oropharyngeal infections, including acute herpetic gingivostomatitis. This disease is observed in young adolescents and adults but has its highest incidence in infants and children younger than 6 years of age. There is no predilection for either sex with the primary infection, the virus moves through nerves to neuronal ganglia where it remains dormant until reactivated by various stimuli including trauma, exposure to sunlight or ultraviolet lamps, fever, stress, fatigue, menstruation, pregnancy, upper respiratory tract infection, allergy or gastrointestinal disturbance. Most of the cases are asymptomatic.20

Management

The goal of therapy for herpetic gingivostomatitis is the relief of pain to facilitate maintenance of nutrition, hydration, and basic oral hygiene. It includes gentle debridement and the relief of pain (e.g., topical anaesthetic rinses). 20

SUMMARY

Gingivitis can progress to incipient adult periodontitis in a sizable proportion of adolescents. Although the prevalence, extent and severity increase with age, this is generally not a severe form of periodontitis, and progression may be rather slow if untreated. Nevertheless, this represents the transition from a reversible to an irreversible periodontal condition, and as the effects of periodontal breakdown will become cumulative over the lifetime of the patient, therapy should be aimed at preventing or limiting progression.

Mucogingival problems may be a presenting complaint in the younger age groups. These should be clearly differentiated from plaque-induced periodontal disease, and understanding the predisposing factors will aid diagnosis and management.

Considering these variables should enable the pediatric dentist to diagnose gingival inflammation, attachment loss, or CEJ-ABC distances which are out of proportion to age and the amount of dental plaque. These situations may be indicative of a high susceptibility to periodontal diseases or reflect systemic conditions which affect the periodontum.

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