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Localised Aggressive Periodontitis – A Review

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Review Article

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ABSTRACT

The term "periodontal diseases" includes any inherited or acquired disorders of the tissues that are supporting the teeth i. e Gingiva, Cementum, PDL, and Alveolar bone. The periodontal disease can be either localized or generalized. Localized aggressive periodontitis (LAgP) patients have interproximal attachment loss on at least two permanent first molars and incisors, with attachment loss on no more than two teeth other than first molars and incisors. In children and adolescents LAgP occurs without clinical evidence of systemic disease and it is characterized by the severe loss of alveolar bone around permanent teeth [10]. Most commonly the disease is localized to the permanent first molars and incisors.

Aim: The aim of this review article is explain in details about aggressive periodontitis including different management aspect of the same.

Methods: This paper presents a review of the aggressive periodontitis in children. An electronic search was conducted using Pub Med®/MEDLINE, and Google search using the terms:

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Periodontium, Localized Aggressive Periodontitis, Children and periodontal health, periodontal health in adolescents, gingival disease in children, periodontal disease in children, gingivitis, periodontitis, gingival disease and its prevalence, periodontal disease and its prevalence.

Keywords: Periodontium; Localized aggressive periodontitis; children.

1. INTRODUCTION

The word periodontium comes from the Greek terms, 'peri-' which means "around," and '-odons', which means "tooth." Periodontium includes the tissues that surround and support the teeth which included Gingiva, Cementum, Periodontal ligaments, and Alveolar bone [1,2]. The periodontium of the primary dentition differs from that of the permanent dentition in numerous aspects [3]. In case of primary dentition the gingiva appears to be more reddish, vascular, and flabby and it lacks stippling [1,4]. Periodontal ligaments in children are wider and they have less dense fibers [1,3,4]. The alveolar bone in case of primary dentition has less trabecula and calcification, more marrow spaces, and they have greater blood supply and lymphatic drainage [1,3,4]. At the molecular level periodontium of the primary dentition resorbed more easily as it contains more amount of sialoprotein and osteoprotein, which ultimately facilitates the binding of odontoclast [1,5-7].

The periodontal disease can be either localized or generalized. Localized aggressive periodontitis (LAgP**)** patients have interproximal attachment loss on at least two permanent first molars and incisors, with attachment loss on no more than two teeth other than first molars and incisors. The onset of these diseases in young individuals is often circumpubertal. Some investigators have found that the localized form of aggressive periodontitis appears to be self-limiting, [8] while others recommend that it is not [9].

In children and adolescents LAgP occurs without clinical evidence of systemic disease and it is characterized by the severe loss of alveolar bone around permanent teeth [10]. Most commonly the disease is localized to the permanent first molars and incisors. However, bone loss around the primary teeth can be an early finding in the disease as found by some retrospective data obtained from LAgP patients [11].

The prevalence of LAgP in geographically diverse adolescent populations range from 0.1 to 15% [11-20]. Most reports suggest a low prevalence of 0.2%, but it is distinctly greater in African American populations of 2.5%.Generally LAgP form a very little supragingival dental plaque or calculus [10,21]. which is in contrast with other investigators who found plaque and calculus at levels similar to other periodontal diseases [22,23]. The most common bacteria of apparent etiologic importance include highly virulent strains of *A.actinomycetemcomitans* in combination with Bacteroides-like species [24-27]. In some populations, *Eubacterium sp*. have been associated with the presence of LAgP [28,29].

In LAgP patients a diversity of functional defects have been reported in neutrophils [30-32]. These include anomalies of chemotaxis, [33-35] phagocytosis, [36,37] bactericidal activity, [38]superoxide production, [39-43] FcgIIIB (CD16) expression, [44] leukotriene B4 generation, [45,46] and Ca2+–channel and second messenger activation [47-51]. The defect in chemo taxis is thought to be an intrinsic defect by some investigators [52-55] and an induced defect by others [56]. The influence of these functional defects on the susceptibility of individuals to LAgP is unknown, but it is possible that they play a role in the clinical course of disease in some patients. Indeed, in some cases exhibiting phagocyte abnormalities, neutrophil defects may still be present after treatment [57]. Molecular markers of LAgP can include an abnormally low number of chemo attractant receptors [58-61] and an abnormally low amount of another cell surface glycoprotein designated GP-110 [62,63]. Adherence receptors on neutrophils and monocytes, such as LFA-1 and Mac-1, are normal in LAgP patients [62,63].

Treatment methods for aggressive periodontitis are often similar to those used in chronic periodontitis. These include:

1. Oral hygiene instructions.
2. Reinforcement and evaluation of the patient's plaque control.
3. Supragingival and sub gingival scaling and root planning.
4. Control of other local factors.
5. Occlusal therapy, if necessary.
6. Periodontal surgery, if necessary.
7. Periodontal maintenance

Aggressive periodontitis may, however, require additional treatments beyond those of chronic periodontitis. A general medical evaluation may rule out underlying systemic diseases. Adjunctive antimicrobial therapy, as well as microbial identification and antibiotic testing, should be considered [5]. The long-term outcome may depend on patient compliance. When the primary teeth are affected, the eruption of the permanent teeth and their attachment Levels should be monitored. Finally, evaluation and counseling of family should be done.

2. METHODS

This paper presents a review of the aggressive periodontitis in children. An electronic search was conducted using Pub Med®/MEDLINE and Google search using the terms: Periodontium, Localized Aggressive Periodontitis, Children and periodontal health, periodontal health in adolescents, gingival disease in children, periodontal disease in children, gingivitis, periodontitis, gingival disease and its prevalence, periodontal disease and its prevalence. The articles were selected of past 40 years. From this search, the articles which matched these criteria and keywords were selected for review purpose.

2.1 Management of Periodontal Disease in Pediatric and Adolescent Patients

2.1.1 Plaque control

Plaque control program should be planned depending on the chronological age and manual dexterity [64]. Scrub technique of tooth brushing technique has been found to be most effective in children but the modified Bass technique and can also be taught to adolescents [64,65,66]. Since periodontal lesions predominantly being interdentally, older individuals can be advised use of interdental cleaning aids [67].

2.1.2 Nonsurgical periodontal therapy

Microbial plaque load which is significantly reduced after scaling and root planing brings down the level of inflammatory cytokines which ultimately reduce inflammation, bleeding on probing, and probing depths in LAgP [68,69]. In LAgP, however motile organisms (*A. actinomycetemcomitans)*invade the soft tissues of the periodontium causing recolonization leading to a poor clinical response to therapy [70]. Scaling and root planing, tongue brushing with 1% chlorhexidine for 1 min, mouth rinsing with 0.2% chlorhexidine for 2 min, and irrigation of periodontal pockets with 1% chlorhexidine was found to result in better response in clinical outcomes in cases of LAgP [71].

2.1.3 Systemic antimicrobial therapy

A. actinomycetemcomitans can recolonize periodontal pockets after scaling and root planing, therefore use of systemic antimicrobials are indicated in such cases [72]. The antibiotics are commonly administered for a period between 7 and 14 days. The dosage should be adjusted as per the child weight and age. Tetracycline cause tooth discoloration in calcifying teeth and photosensitivity and depress skeletal growth in children therefore they are not recommended in children of <8 years of age. Also it is not recommended for pregnant and lactating women. As per adult doses and individuals weighing 40 kg and more, metronidazole and amoxicillin 250–500 mg each, given TID for 8 days is appropriate for most cases of severe periodontitis [73]. Metronidazole and ciprofloxacin 500 mg each, given bid for 8 days is effective against some enteric Gram-negative rods not affected by the metronidazole-amoxicillin regimen Clindamycin has very little impact on *A. actinomycetemcomitans* [74]. As per adult doses and individuals weighing 40 kg and more, amoxicillin 500 mg and potassium clavulanate 125 mg bid have shown good results in AP owing to potassium clavulanate being an inhibitor of beta-lactamase and thus overcoming the bacterial resistance to amoxicillin [73].

2.2 Surgical Therapy

Surgical therapy is carried out to facilitate more accessibility and also the instrumentation of affected sites to remove tissue which are invaded by *A. actinomycetemcomitans*. At the same time, osseous defects which results from the disease process can be subjected to regenerative procedures to improve osseous support and also to enhance the prognosis of the teeth. Open flap debridement along with systemic antimicrobial therapy in LAgP has found to significantly reduce probing depths and improve attachment levels in affected teeth. With defect morphology being favorable, Guided Tissue Regeneration has shown good results in the treatment of LAP as compared to when osseous grafting is performed [75-81].

2.3 Maintenance

A periodontal examination needs to be carried out during each visit to monitor the stability of attachment levels and check for inflammation.

Radiographic evaluation can be carried out in high risk teeth with de plaquing and occlusion adjustments performed when indicated.

3. CONCLUSION

Aggressive periodontitis is associated with systemic conditions which commonly affect children and adolescents. Moreover incipient form of chronic periodontitis may be more common in children. Early diagnosis is needed for early management in these conditions. Aggressive periodontitis has a characteristic pathophysiology in its onset and progression. This review presents evidence obtained from previous investigations carried out regarding periodontitis in children. It also explains about the detailed Management of Periodontal Disease in Pediatric and Adolescent Patients.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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