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Critical Evaluation of the 2017 Classification of Periodontal and Peri-implant diseases and Conditions – An Update

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Abstract

Periodontal disease is the multifactorial disease that leads to the destruction of the tooth-supporting structures. A classification system provides a framework that helps in diagnosis and assembles similar disease phenotypes in a more homogeneous form. Several classifications have been proposed by many authors. Till date, the American Academy of Periodontology (AAP) 1999 Classification was the most extensively used classification, which was designed to overcome the drawbacks and deficiencies of the 1989 classification. However, presence of some drawbacks has limited its use in routine clinical practice. So, the current classification has been developed in 2017 by AAP and the European Federation of Periodontology (EFP) to overcome the disadvantages of the 1999 classification. The 2017 classification is extremely extensive and more intricate than 1999 classification, which is useful to the overall dentist and periodontists to select the best treatment options for the patients. This review summarizes the newer classification, key changes from 1999 Classification/modification and disadvantages of the newer classification.

Keywords: Classification 2017, Periodontal disease, Peri-implant disease.

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INTRODUCTION

A new classification system has originated from the 2017 World Workshop for Periodontal and Peri-Implant Diseases and Conditions, co-hosted by the American Academy of Periodontology (AAP) and the European Federation of Periodontology (EFP) [1]. These are changes first made since 1999 classification. The new classification covers a wide range of different periodontal conditions in order to enable clinicians to diagnose and treat them accordingly.

The major development in this classification is the re-categorization of all three forms of periodontal diseases, in various stages and grades for the periodontal disease and addition of peri-implant diseases and conditions.

The previous classification proposed in 1999 had some drawbacks like it did not include the peri-implant diseases and it had some loopholes regarding the criteria of periodontal diseases. In addition to this, it did not give any adequate information in context to risk factors like smoking and the patient's response to periodontal therapy.

All these downsides of 1999 classification led to the emergence of a new classification system in 2017 developed by the AAP and the EFP [1]. The new classification will help periodontists and general dentists to understand the etiology of disease in a better way and choose an optimal treatment plan for periodontal disease.

NEED FOR A CLASSIFICATION SYSTEM

The classification system helps in providing a framework that helps in studying etiology, pathogenesis and treatment of the diseases. The complexity of periodontal diseases can be explained by classifying various diseases.

Its goals are [2]:

1) Classification of diseases helps us to communicate with other clinicians, researchers, educators, students, epidemiologists and public health workers.

2) Also helps us to formulate the treatment plan, predict the outcome of treatment as well as to explain to the patient about the disease.

3) Assemble similar disease phenotypes in more homogeneous syndromes.

4) It also helps to differentiate between various types of disease and their process.

HISTORICAL PERSPECTIVE OF THE PERIODONTAL DISEASE CLASSIFICATION SYSTEM

The first specific name 'SCURVY OF THE GUMS' was given by Fauchard in 1723. Joseph Fox in 1806 tries to classify gum disease gave the first periodontal classification [3].

Orban in 1942 introduced the first classification scheme according to the principle of basic pathology and etiology, which was accepted by AAP and obtain wide acceptance. During past 40 years, multiple classifications of periodontal disease were proposed by AAP. Despite this, a further workshop was convened by the AAP in Princeton 1989, amending the classification [3]. In 1999 a world workshop was conducted for formulating the classification system. It has been in use for the last 19 years. Later, a newer classification was proposed by AAP and EFP in 2017. This article helps us to differentiate between 1999 classification and newer classification.

2017 WORLD WORKSHOP ON THE CLASSIFICATION OF PERIODONTAL AND PERI-IMPLANT DISEASES AND CONDITIONS (Adapted from Caton *et al*.)[1]

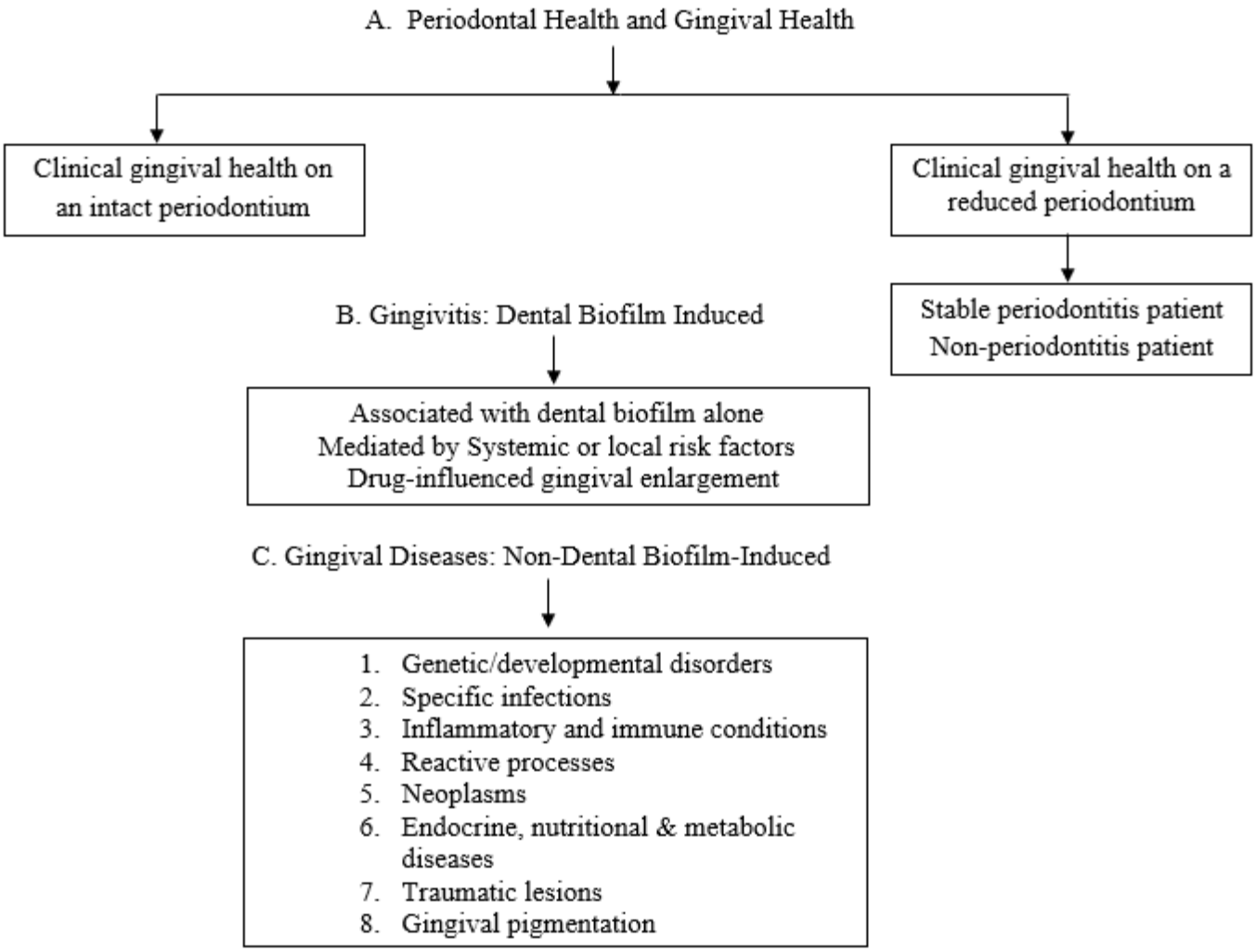
The newer classification was proposed based on ICD (International Classification of Diseases).

1. Periodontal diseases and conditions.

2. Peri-implant diseases and conditions.

1. Periodontal Diseases and Conditions:

I) Periodontal health, gingival diseases and conditions:



II) Forms of Periodontitis:

A. Necrotizing Periodontal Diseases

- Necrotizing Gingivitis
- Necrotizing Periodontitis
- Necrotizing Stomatitis

B. Periodontitis

Stages: Based on Severity and Complexity of Management
Stage I: Initial Periodontitis
Stage II: Moderate Periodontitis
Stage III: Severe Periodontitis with potential for additional tooth loss
Stage IV: Severe Periodontitis with potential for loss of the dentition

Extent and distribution
Localized, generalized, molar –incisor distribution

Evidence or risk of rapid progression, Grades: anticipated treatment response
Grade A: Slow rate of progression
Grade B: Moderate rate of progression
Grade C: Rapid rate of progression

C. Periodontitis as Manifestation of Systemic Diseases

Based on the primary systemic diseases according to the International Statistical Classification of Diseases and Related Health Problems (ICD) codes.

III) Periodontitis as a manifestation of Systemic Diseases and Developmental and Acquired Conditions:

A. Systemic diseases or conditions affecting the periodontal supporting tissues

B. Other Periodontal Conditions

- Periodontal Abscesses
- Endodontic-Periodontal Lesions (EPL)

C. Mucogingival Deformities and Conditions around teeth

1. Gingival phenotype
2. Gingival/soft tissue recession
3. Lack of keratinized gingiva
4. Decreased vestibular depth
5. Aberrant frenum/muscle position
6. Gingival excess
7. Abnormal color
8. Condition of the exposed root surface

D. Traumatic Occlusal Forces

- Primary occlusal trauma
- Secondary occlusal trauma
- Orthodontic forces

E. Prosthesis and tooth-related factors that modify or predispose to plaque-induced diseases/periodontitis

1. Localized tooth-related factors
2. Localized dental prosthesis-related factors

2. Peri-Implant Diseases and Conditions:

A. Peri-implant health
B. Peri-implant mucositis
C. Peri-implantitis
D. Peri-implant soft & hard tissue deficiencies

CRITICAL EVALUATION OF NEWER CLASSIFICATION SYSTEM

A. Gingival health:

- Gingival health is an important aspect to consider as gingivitis is further going to progress to periodontitis if not controlled in time. Controlling gingival disease is the first and foremost preventive strategy for periodontitis [4].
- Attachment loss can be predicted at inflamed sites in the future, but not all the inflamed sites are going to progress to periodontitis. Thus it would not be wrong to state that gingival and periodontal healths are highly dependent on the host response. Thus this connection will help the clinicians to diagnose the disease in the early stages and its management.

B. Periodontal health:

- The **definition of periodontal health** is stated in the newer classification.
- **Periodontal health** is used to depict the state of inflammation tissue free from any inflammatory disease that can cause destruction of periodontal support [4].
- The periodontal health is divided into 4 levels. Based on the following[5] :

Normal or reduced periodontal attachment level and bone level, the capacity to control modifying factors as well as the relative treatment results.

- These four levels of periodontal health are as following[6]:

(1) Pristine periodontal health (2) Clinical periodontal health (3) Periodontal disease stability (4) Periodontal disease remission/control.

C. Dental Plaque biofilm induced Gingival Lesion [4]:

- The term plaque-induced is now converted into **dental biofilm induced**.
- In newer classification included Smoking, nutritional factors, pharmacological agents, sex steroid hormones, hematological conditions **(systemic risk factors)**.
- The older terms such as a gingivitis associated with menstrual cycle, oral contraceptive and ascorbic acid were **discarded [7]**.
- Leukemia and Blood-related Dyscrasias are now classified under hematological conditions.
- To define the extent and severity of the drug-influenced overgrowth in an easy and appropriate manner was taken into account in the 2017 Classification.
- One of the important changes made in gingival plaque-induced gingival diseases was the simplification of classification system to include only clinically identifiable conditions affecting the gingiva.

D. Non–Plaque-induced gingival diseases and conditions [5]:

- Necrotizing periodontal diseases and Mycobacterium tuberculosis are added under the category of specific infection of bacterial origin.
- Candidasis is added and linear gingival erythema removed in specific infection of fungal origin.
- Viral diseases described broadly in newer classification. Coxsackie virus (hand foot mouth disease), Human papilloma virus, Molluscum Contagiosum were newly joined under the category of specific infection of viral origin.
- In 2017 classification, gingival pigmentation and Neoplasms category are newly added. Gingival pigmentation like drug induced gingival pigmentation, amalgam tattoo etc., was introduced in newer classification.
- Erythema Multiforme and Drug-induced categories are abolished.
- Granulomatous inflammatory lesion, hypersensitive reaction and Reactive process category in which refers to the presence of epulis were added.
- Mucocutaneous disorders replaced by auto-immune disease of the skin and mucous membrane.
- The non-dental plaque-induced conditions were classified based on their etiology as oral and systemic healths are very strongly interrelated with each other. This will help general dentist and other health care workers to adequately diagnose and plan treatment accordingly.

E. Necrotizing Periodontal Diseases:

- The older terms like Necrotizing ulcerative gingivitis (NUG) and Necrotizing ulcerative periodontitis (NUP) are replaced with Necrotizing gingivitis and Necrotizing periodontitis. The terminology **"ulcerative"** was eliminated [8].
- **Necrotizing Stomatitis** term is added.

F. Periodontitis:

- The terms chronic or aggressive periodontitis are grouped under "**Periodontitis**".
- This newer classification is made up of various **stages** and **grades**.
- **Staging** mainly depends on severity of diseases, also depends on the complexity of the disease management as well as additionally described as the extent and distribution of the disease in the dentition [9]. Attachment loss as well as tooth loss or radiographic measurement of bone loss decides to severity of the disease. The probing pocket depths, Vertical and Horizontal defects, Furcation involvement, Ridge defect etc. will decide the complexity of the disease.

- **Grading** of periodontal disease presents the progression rate of disease, the response to treatment of periodontal disease and the effect of systemic health on periodontal disease [9]. Three types of grading are mentioned: Grade A, B & C as slow, moderate and rapid progression, respectively.

- Smoking and Diabetes are also taken into consideration as the possible risk factors which can alter the staging of periodontal diseases.

G. Systemic diseases or conditions affecting the periodontal supporting tissues[10]:

- Systemic disorder like Papillon-Lefèvre syndrome manifested early onset of severe periodontitis which is classified depends on the primary systemic disease.

- Other systemic conditions affecting periodontal tissues are considered as systemic diseases or conditions affecting periodontal supporting tissue. Examples: Neoplastic diseases of Periodontium.

H. Other Periodontal Conditions:

- Any abscess of periodontium is described as a **periodontal abscess**.

- The terms gingival abscess and pericoronal abscess are **eliminated**.

- Classification of Endo-Perio Lesion should be established based on the clinical features available at the time of lesion is identified.

I. Mucogingival Deformities and Conditions around teeth [10]:

- Periodontal biotype, severity of gingival recession, a dimension of the residual gingiva, presence/absence of non-carious cervical lesions, caries and dentin hypersensitivity, an aesthetic concern of the patient is newly added in 2017 classification.

- The older term *periodontal biotype* was renamed as ***periodontal phenotype***.

J. Traumatic occlusal forces:

- The terminology occlusal forces are now converted into "Traumatic Occlusion force" [10].

- There is a lack of evidence which showed that traumatic occlusal force accelerates the progression of periodontitis and non-carious cervical lesions or gingival recessions which can be caused by traumatic occlusal.

K. Prosthesis and tooth-related factors that modify or predispose to plaque-induced diseases/periodontitis[10]:

- The prosthesis- related factors modified in the newer classification.

- The term *biologic width* should be converted into ***supracrestal tissue attachment***.

- The altered passive eruption is included as a tooth-related factor, that was absent in the previous classification. These factors are associated with dental plaque induced gingival inflammation and it will lead to destruction of supporting tissues.

- A clinical procedure involved in the made up of indirect restorations and hypersensitivity/toxicity reactions due to dental materials has been added.

- It was reported that disturbance of restorative margins within the supracrestal connective tissue attachment will lead to inflammation and destruction of Periodontal structures. Although, the etiology of these is not yet clear.

L. Peri-Implant Diseases and Conditions:

- Peri-implant diseases and conditions which address about characteristics of soft and hard tissue deficiency related to implant are added in current classification[11].

TAKEAWAYS FROM THE NEWER CLASSIFICATION

1. Newer classification is based on ICD (International Classification of Diseases).

2. The newer classification is broader than the previous classification and will help the clinicians in better diagnosis and treatment of periodontal diseases.

3. It was earlier difficult to differentiate between chronic and aggressive periodontitis. So, now staging and grading method is applied which clearly defines the disease.

4. The new system for grading introduces biomarkers for better understanding of progression of disease and more treatment options.

5. Staging depends not only on the severity but also on the complexity of disease management. Four types of staging are mentioned.

6. Periodontal biotype is replaced by the term periodontal phenotype.

7. A traumatic occlusal force has replaced the term excessive occlusal forces.

8. The new classification has included clinical procedures used in the fabrication of indirect restorations.

9. Peri-implant diseases and conditions are added in new classification.

DISADVANTAGES OF NEW CLASSIFICATION

1. The new classification is definitely more extensive than the previous one and time will decide how the clinicians and academicians apply it practically to diagnose and treat the periodontal diseases.

2. No classification system can be considered as perfect as new research will lead to new knowledge and hence new changes.

3. Concerns have been raised about practical application of new classification in day to day practices.

CONCLUSION

New classification provides new insights for the better understanding and treatment of gingival and periodontal conditions. It has included the etiologic factors into consideration which will help the clinicians to diagnose the periodontal conditions in a better way. Biomarkers have been added so as to help understand the progression of the disease and develop treatment plan accordingly. This article provides an update and critical appraisal of the current classification. Introduction of definitions of Peri-implant diseases and conditions is a distinguishing characteristic of this classification. This Classification addresses the flaws of 1999 classification. Time will decide how the new classification will help periodontists and general dentists to understand the etiology of disease in a better way and choose an optimal treatment plan for periodontal disease. But the limitations of this classification are the limited use of this classification for epidemiological surveys due to the complex nature of the classification and to implementation in clinical dentistry.

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Conflict of Interest

The authors declare no conflict of interest.

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