Diagnosis: Latin America and the Caribbean Consensus 2024

Abstract: This is a new version of the LAOHA Consensus on Periodontal Disease and its impact on general health in Latin America. Five years after the first version, knowledge has increased, and diagnosis of periodontal disease has evolved. Of especial interest in this topic is the emerging studies that have used the AAP/EFP Classification of Periodontal and Peri-Implant Diseases and Conditions. The art of diagnosis core for preventive and therapeutic strategies. To make an accurate and effective diagnosis, knowledge about the health-disease process is fundamental. This paper updates and demonstrates challenges in periodontal diagnosis, especially in Latin American countries. Considering that periodontal diagnosis should be based on knowledge of the etiopathogenesis of periodontal diseases, this paper highlights aspects developed in the last years and emphasizes the established knowledge considering diagnosis of periodontal diseases. Available evidence stresses the importance of interviewing the patient, thorough periodontal charting, and requesting any imaging and other complementary tests necessary. An important observation is that partial periodontal data recordings used for screening are not diagnostic methods and might underestimate disease. Also, the paper approaches other forms of recognition of periodontal diseases that could be used, however not for diagnosis, but to increase awareness and eventual referring individuals. Latin American countries need to increase the awareness of periodontal diseases both by the population and the profession and to prioritize correct

periodontal diagnosis. Dental education needs to establish strategies in order to understand that diagnosis is pivotal for any clinical approach.

Keywords: Diagnosis; Periodontal Diseases; Latin America.

INTRODUCTION

In 2019, the Latin American Oral Health Association performed a Consensus Meeting with representatives of several countries and representative Scientific Associations, that generated important publications for the region, trying to address the impact of periodontal diseases in Latin America. After 5 years, a new Consensus is warranted, since knowledge evolved considerably. The section about diagnosis, which is of interest for the present paper, was published by Rösing et al., after the contribution of the participants of the Consensus Meeting (Rösing et al, 2020). The present paper updates and makes new insights in the previsouly published Consensus Report. It is a narrative review, performed after extensive and systematic search related to periodontal diagnosis.

Diagnosis of periodontal diseases and conditions has been subject to a series of controversies that led to difficulties in communication, and especially to different clinical approaches in Dentistry. In the Glossary of Periodontal Terms of the American Academy of Periodontology, periodontal diagnosis has been defined as "The process (or opinion derived from the process) of identifying the nature and cause of a disease of the periodontium; relevant information used in this process typically includes medical and dental histories, clinical and radiographic examination of the patient, and laboratory findings" (AAP). The art of diagnosis should be considered above any classification system which, per se, is an arbitrary way of distinguishing different forms of disease and conditions. However, classification systems might sheed light in the possibility of

communication. This paper approaches the diagnosis of the periodontal health/disease process, in an endeavor to understand its challenges, and to propose possible solutions, especially for Latin American countries. The paper will be publically evaluated before its final version and contributions will be included in the article.

Historically, Dentistry has focused mainly on dental caries, since this still is the major cause of tooth loss, pain, and impairment of oral health. This focus led to underdiagnosis of periodontal diseases and other oral conditions. The decline in occurrence estimates of dental caries, and the understanding of the importance of more comprehensive oral care, impulse the understanding that periodontal diseases need to be looked upon with more attention, from a health perspective of individuals and populations. This is supported by evidence of the role of periodontal diseases in oral outcomes e.g. tooth loss, as well as possible relations with other systemic conditions and oral health-related quality of life.(Cardoso et al, 2018; Haag et al, 2017;Sanz et al., 2018) Studies have demonstrated that routine periodontal diagnosis is not performed as it would be expected. This is probably related to the specificities in periodontal diagnosis as well as a reflection of dental education still focused mainly in dental caries and its consequences.(Haag et al., 2017; Preshaw, 2015) Also, of importance is the fact that health systems do not value periodontal diagnosis and treatment as they should.

Diagnosis of the Periodontal Health/Disease Process

It is important to recognize that diagnosis of periodontal health/disease process is completely distinct in epidemiological and clinical settings. Epidemiological surveys describe the occurrence of health and disease states in populations, associating them with possible risk factors/indicators. In this sense, epidemiological studies are not focused in individual diagnosis. It is notable that epidemiological studies use cut-off points that not always are the most used outcomes in clinical settings. There is a misunderstanding of the role of epidemiological studies that leads to misinterpretation of diagnosis of periodontal diseases. Outcomes in epidemiological surveys are arbitrarily posed especially related to the main objectives of the study. Several surveys are reported in different articles with distinct primary outcome cut-off points. Data from epidemiological studies will be used to build the knowledge that will guide the process of individual diagnosis (Ke et al., 2023; Holtfreter et al, 2024;).

As stated in the definition of periodontal diagnosis, from an individual perspective, it should be focused on the person as a whole, combining information not only from the clinical examination (AAP access 2024). For that reason, the vision of an individual diagnosis based on local and systemic conditions and risk factors of each patient must be an exercise that leads to the best treatment strategy. Moreover, there is one point of consensus: periodontal disease cannot be diagnosed after the tooth is about to be lost due to periodontal breakdown! This is lack of responsibility of the profession, that seems to underdiagnose periodontal diseases.

Periodontal diseases have been classified in different ways. The point that needs to be reinforced is that the periodontal health/disease process clinically manifests in two main types of impairment: gingivitis and periodontitis. The distinction between these two diseases is mainly based on the concomitant occurrence of loss of attachment. Gingivitis is an inflammatory process triggered by the presence of supragingival biofilm and is not associated with loss of periodontal apparatus. Periodontitis occurs after imbalance between the presence of subgingival biofilm and the host response, leading to loss of periodontal attachment and bone. It is well recognized that periodontitis has important risk factors in its causal chain that should be emphasized in prevention, diagnosis and treatment. Since both diseases have a background of an inflammatory process, diagnosis should include these aspects in the interview with the patient, in the physical examination, and with additional diagnostic tests that could help in the diagnosis.(Armitage, 1999; Caton et al., 2018)

In 2018, a Joint Workshop hosted by both the European Federation of Periodontology and the American Academy of Periodontology launched a new classification system for periodontal and peri-implant diseases and conditions. An impressive effort was made to improve the existing classification systems.(Caton et al., 2018) Professionals usually require a learning curve to enable the new classification system to be adopted worldwide. The system comprises gingival health, gingivitis, periodontitis and peri-implant diseases and conditions. After more than 5 years, the profession has used the system and continues in the learning curve (Holtfreter et al.,

2024). But it should be understood that the AAP/EFP system is not any longer new and is suffices for an evidence-based diagnosis of periodontal diseases. (Ke et al., 2023) The system is based on the best available evidence, however, in some situations low-level evidence had to be used. An extremely important aspect to understand is that the classification system was not meant to be a priority for epidemiology or research, but was meant for individual diagnosis. Of course, it needs to be understood that the extensive study conducted in the literature should be the basis for epidemiological and research, without the need for complete standardization between these two activities. This paper acknowledges that a part of the system was dedicated to defining gingival health - from pristine gingival health to clinically healthy gingiva. In addition, this paper points out that periodontitis was mainly classified into stages and grades. This system allows the understanding that in each patient, both rate of progression and the way the function is affected, and accounts for tooth loss, for example. (Caton et al., 2018)

It is also of interest to mention that in 2019 one important paper was published alerting for the importance of ending the neglegt with global oral health, suggesting radical action. This includes the comprehension of the broad spectrum of pathogenesis of the disease process and, of course, making an amplified strategy for diagnosis and prevention (Watt et al., 2019)

Periodontal Diagnosis in Practice

This paper emphasizes the importance of general practicioners and specialists being well trained in diagnostic capabilities. Specialists should also dedicate more in depth examination of complex cases (Ke et al., 2023;). Furthermore, although this article has focused on periodontal diagnosis, it is mandatory that dentists should be proficient in oral health diagnosis. For example, root caries is a very frequent situation in periodontal individuals, and it should not be underdiagnosed. It should be kept in mind that before being specialist in any area of Dentistry, professionals are general dentists and diagnosis should not be considered part of specialized care (Hugo et al., 2021).

The interview with the patient is of utmost importance in periodontal diagnosis. This is a challenge for the profesion, since a comprehensive interview is one of the keys of diagnosis of all conditions, including periodontal diseases. It is noteworthy that simply reading even validated questionnaires might not be enough to collect data from a suffering individual In terms of other systemic conditions, over 50 conditions have been associated to the occurrence of periodontal diseases, from hormonal changes, exposure to environmental factors to rare syndromes.(Armitage, 1999, Caton et al.,, 2018) Professionals need to have this knowledge and incorporate it into the interview with the patient. Moreover, since periodontal diseases are linked to behavioral components including oral hygiene methods, these should be part of the diagnostic process. The interview with the patient is also part in treatment. For example, motivational interview strategies are used both in diagnosis as in clinical management of chronic diseases (Kopop et al., 2017; Stenman et al., 2018; Gillam, Yussuf, 2019)

The physical examination should consider the understanding that periodontal diseases are of a chronic nature. The progression of untreated periodontitis is known to be slow, therefore limiting the rapid clinical impact. (Teles et al.,s 2018) In this sense, periodontal physical examination still is based on the history of disease. In addition, the presence of inflammatory signs is of utmost importance in diagnosis of periodontal diseases. Therefore, the most used diagnostic tool is periodontal probing, for the purpose of understanding both the inflammatory status (e.g. with probing depth or bleeding on probing) or the history of disease (with loss of attachment). This is also one of the best tools for monitoring progression of disease over time.(Donos, 2018) Considering the foregoing information, it is a consensus that in some way, every dentist needs to perform periodontal probing in every patient. This is one of the challenges of periodontal diagnosis, since there is a perverse understanding that periodontal diagnosis is for specialists (Rösing et al.,2020).

The AAP/EFP classification system calls for probing attachment loss to enable better diagnosis of periodontitis.(Caton et al., 2018) Of course, for epidemiological reasons, periodontal probing to obtain the history of disease progression should be performed mainly in adult individuals. Children should be periodontally diagnosed with probing and/or radiographs if they have family history of periodontal disease. On the other hand, measurements for detection of gingival inflammation are needed from childhood (Medina-Vega et al., 2024; Botero et al., 2015)

Periodontal probing is known to be time consuming and laborious and this is one of the reasons why it has not been as widely used as expected. This paper urges that dental training reinforces the importance of using this tool to increase the quality of oral diagnosis.(Caton et al., 2018) Reported differences have been observed for different types of probes (manual vs. automatized/computerized).(Donos, 2018) Therefore, practitioners are encouraged to use any type of probe. The gold standard for periodontal diagnosis is full mouth periodontal examination, i.e. periodontal probing in six sites per tooth (disto-buccal, mid-buccal, mesio-buccal, disto-palatal/lingual, mid-palatal/lingual, mesio-palatal/lingual). When this approach is adopted, there are few chances of misdiagnosis of periodontal diseases.(Kingman et al., 2008; Silva-Boghossian et al.,2008) However, other simplified approaches have been proposed in an attempt to increase the number of dentists routinely performing periodontal examinations. (Preshaw, 2015).

Accepting the challenges and difficulties of proper periodontal diagnosis, it should be remembered that other strategies (not for diagnosis) could be used. In this sense, one could pose different terms such as recognition, awareness, detection, screening, etc. could be used.For decades, Dentistry has searched for esimplified periodontal diagnostic tools without success. However, the information given by this extensive work should not be discarded. However, repeatedly diagnosis cannot be derived from these tools.

For example, it should be kept in mind that screening is the main aim of any type of partial examination, thus if periodontal disease is found by means of this approach, complete periodontal charting is mandatory. Susin et al.(2005) tested 7 partial recording

protocols based both on full mouth and in half mouth examinations and observed that all partial examination protocols underestimated the occurrence of periodontal disease. The best partial recording protocol found in this study was probing 3 sites per tooth (mesio-buccal, mid-buccal and disto-lingual). Nevertheless, this is still time consuming. The more sever the disease is, the worse partial recording for periodontal diagnosis will be. Therefore, the recommendation is that if an individual has periodontitis, full-mouth periodontal probing must be performed.

An alternative has been proposed for periodontal screening; that is the so called basic periodontal examination (periodontal screening and recording).(Preshaw, 2015) This examination is based on probing all the teeth and scoring the sextant according to probing depth. When deeper probing depths are observed, a full-mouth periodontal examination is recommended. This is an interesting alternative, for those who understand that periodontal charting is not necessary. The underestimation of periodontal diagnosis is a reality with this tool and should be stressed. On the other hand, if this were the only alternative considered for periodontal diagnosis, this would allow screening of more severe cases. Screening is an effective way of covering a larger number of the population. In different settings, this should be subject to discussion. The premise is that “doing something is better than doing nothing”. This is partially true, especially in individual situations. It should be re-emphasized that screening is not diagnosis.

Several studies have been performed in the last years with the AAP/EFP classification system. These studies comprise epidemiological surveys and clinical

studies. It should be kept in mind that the AAP/EFP classification is only possible and feasible to be used with complete periodontal charting. (Caton et al., 2018; Holtfreter et al., 2024)

In addition to interviewing the patient and periodontal physical examination, additional diagnostic tests are available. Image tests are the most used in terms of periodontal diagnosis. However, considering the international guidelines for radioprotection, they should be preceded by clinical indication, i.e. data from either the interview with the patient or from the physical examination are the core factors for indicating imaging examinations. The most common image tests used in periodontal diagnosis are periapical and panoramic radiographs, and more contemporarily, the cone-beam computed tomography (CBCT). All of them expose the individual to x-rays and therefore need to be limited. This paper recommends that the practitioners must be aware of the international guidelines for radioprotection before indicating such examinations.(Dula et al., 2015) The AAP/EFP classification system clearly uses information of past disease by means of image tests. This is important for standardizing periodontal diagnosis, however, as previously stated, should follow radioprotection guidelines.

The panoramic radiograph is one of the most cost-effective images, however, in cases of periodontal breakdown, it offers limited image detail. Therefore, in cases of moderate disease, complementation with selected periapical or vertical bitewings is warranted, and in cases of severe periodontal disease, a complete periapical radiographic

examination could be necessary. The use of CBCT is restricted to specific periodontal situations, including endo-perio relationships, fractures, perforations, etc.(Tugnait, Carmichael, 2005; Isamail, Yafi, 2024)

The most important aspect of image tests is that they are comprehensively analyzed, in order to yield a better diagnosis. In the specific case of periodontal diseases, the bone crest deserves special attention, both in terms of the presence of lamina dura (which might be indication of periodontal stability), and the amount of lost periodontal bone, especially for future analyses of disease progression.

Sophisticated diagnostic methods have been proposed in the literature, including microbiological, immunological, physical, molecular assays.(Armitage 2013 Kikuchi et al.,s 2022) These methods have been extensively used in research. However, for the clinical approach, they have not proved to be necessary up to now. On the other hand, the desire is that more accurate diagnostic tools will be developed in the future, since the available tools are still based on probing, which is rudimentary and could be replaced by a more precise device. In terms of diagnosis of periodontal diseases, it should be kept in mind that thes sophisticated tools are not and do not have to be routinely used.

Furthermore considering the complexity of peridontal disease, it is not possible to think of the diagnosis of periodontal diseases outside the concept of integral care, which includes additional tests (glycated hemoglobin data in diabetic individuals, or the aid of other blood tests in systemically compromised individuals), but not only that, the professional during the clinical examination should remember that to take care of a human

being is necessary to be considering aspects such as: life history, family dynamics, exposure to risk factors, social aspects and psychology.

Contemporarily, self-report measurements of periodontal diseases, combined or not with some clinical assessment, have been developed. They have been tested and validated against the gold standard, which is complete periodontal charting, in addition to the interview with the patient and additional tests (Cyrino et al., 2011; Bond et al., 2024). Even though they might have been validated, they should not be used for diagnosis of periodontal diseases. These tools are not meant for diagnosis, but they shed some light in terms of increasing awareness, recognition of disease and referring to a dental profession. Several examples of these kind of tools exist. The Periodontal Risk Assessment (PRA) (Lang; Tonetti, 2003) is a system that uses clinical data, together with information from the patient in order to establish risk and to suggest some clinical approaches. The Gingival Health Test is an internet-based questionnaire, that is meant to increase awareness of periodontal diseases. However, it is not meant at all for diagnosis (Duque et al., 2023)

GOALS FOR LATIN AMERICA – CONCLUDING REMARKS

This section reviewed the key aspects of periodontal diagnosis, in an evidence-based approach, trying to summarize the state of the art, and taking into consideration the characteristics of the dental profession in Latin American countries. These countries have

experienced continuous development in oral health care. The efforts in preventing and treating periodontal diseases still have not produced tangible effects in the region. The prevalence of periodontal diseases is still high and a burden of disease is observed across latin-american countries. In addition, cultural and socioeconomic characteristics are common in the area, which call for specific approaches. With the aim of increasing the quality of the profession even further, the following aspects should be considered:

- A call for action is necessary to increase awareness of periodontal diseases to enhance the quality of oral health care and proper maintenance of teeth throughout the patient's life;
- Dental professionals should be trained right from the undergraduate curriculum to appropriately diagnose periodontal diseases and to successfully achieve prevention of periodontal diseases;
- Dental professionals need to increase awareness in the community about periodontal diseases. Therefore, the information that gingival bleeding is not normal, and that other characteristics of periodontal diseases such as tooth spacing or mobility might be signs of periodontal disease, etc. should be spread.

The use of self-reported periodontal awareness tools should be emphasized (based on the high prevalence of gingivitis and periodontitis in the Latin American community). It should be mandatory to emphasize periodontal diagnostic maneuvers regardless of the patient´s reason for consultation.

The definition that periodontal diagnosis needs complete periodontal charting needs to be spread. Other types of examination do no achieve diagnosis and are only useful for screening/recognition. Underdiagnosis needs to be avoided.

- Dental practitioners should be aware of systemic and behavioral aspects that are linked to periodontal diseases and include them in the interview with the patient; they must be able to work at a multidisciplinary level in cases in which this is required to accomplish overall health;
- Oral health professionals should routinely perform periodontal clinical examination, according to the level of disease of the patient;
- Additional diagnostic tests should be understood as being part of periodontal diagnosis and practitioners should know how to use them to obtain their best diagnostic yield;
- Dental professionals should understand the periodontal health/disease process to enable them to approach it correctly, either by themselves or to refer their patients for a proper approach to treatment;
- The continuos evaluation of the evolution of periodontal diagnosis and awareness needs to be surveilled in the Latin American region, in order to increase the quality of practicing dentists.

Dental education needs to include more in depth periodontal diagnosis in all levels of healthcare.

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