Where periodontology has advanced: A critique of current trends in the field

Over the past 20 years there have been some exceptional advances made in periodontology. Many of these have led to changes in our thinking and our approach to periodontal therapy. In 1999, the American Academy of Periodontology (AAP) devised a “new” classification system for the periodontal diseases. From this some 50 different types of periodontal conditions were identified which were considered worthy of individual classification. Clearly this was an unwieldy system and in reality it was distilling down to three main types of plaque-associated periodontal diseases: gingivitis, chronic periodontitis and aggressive periodontitis.

While the appropriateness of the terms “chronic” and “aggressive” may be too simplistic of the heterogeneity of the periodontal diseases. Therefore, it may be timely to revisit such a classification system and determine whether current understanding of the epidemiology and pathobiology of these diseases can be used to better define them.

However, it is worth noting that in the past 25 years at least 10 different classification systems proposed, none of which have been fully adopted. Clearly there remain a number of important challenges in this field. Since chronic and aggressive periodontitis are heterogeneous groups of diseases, for example, there will be unique subcategories based on their multifactorial nature based on microbial, host response and thinking of how the subgingival microflora interacted not only with itself but also the host. Notwithstanding this, research through the 1990’s and 2000’s began to question the role of the biofilm and its component bacterial consortia in the overall process of development of periodontitis. While it was very clear that periodontitis cannot, and will not, develop in the absence of bacteria, it was becoming increasingly obvious that clinically there were some patients who, despite the presence of considerable plaque deposits, had become very compelling. Indeed the relevance of oral health to overall health and general well-being was recognised by the US Surgeon General in a landmark publication titled “Oral Health in America”. This document for the very first time articulated the importance of oral health in an holistic approach to medical care. Despite the title, it contained a major omission of the whole global scene. From this the concept of periodontal medicine gained further traction and its central hypothesis stated that periodontal infection and environmental components. At present, apart from “plaque-associated” designation, the current AAP classification is not based on cause-related criteria.

Recognition that bacteria are necessary but not sufficient for periodontitis to develop. During the 1990’s a very important conceptual advance occurred in our understanding of dental plaque and its interaction within the subgingival environment. The recognition that subgingival plaque existed as a biofilm with its own microecological and communicative properties changed our did not develop periodontitis. On the converse it was also evident that patients who had very minor visible deposits of plaque yet developed very advanced and destructive periodontitis.

These observations led to a major paradigm shift in periodontology in which it was accepted that although plaque was necessary for periodontitis to develop, it was not sufficient for it to develop. Indeed it became evident that in addition to dental plaque, environmental and host response factors were critical for the clinical manifestation of periodontitis. With this came a new more informed management process for our patients which dictated that in addition to management of oral hygiene patients must be assessed for other factors which would lead to the development of periodontitis and these must be controlled in order for treatments to be successful. Indeed, it is now recognised that dental plaque (and its constitutive elements) accounts for only 20 per cent of the risk for developing periodontitis and thus the other 80 per cent of modifying and predisposing factors must be taken into account when diagnosis and treating the periodontal diseases.

Development of the sub discipline of Periodontal Medicine.
The term “Periodontal Medicine” was first proposed by Offenbacher in 1997 as “a broad term that defines a rapidly emerging branch of periodontology focusing on new data establishing a strong relationship between periodontal health or disease and systemic health or disease.” It arose with the emerging evidence suggesting that a number of systemic diseases and periodontal disease were inter-related. By 2000 the evidence that oral health and systemic health should not be separated

“It remains to be established whether treatment of periodontitis has any impact on systemic conditions...”

Environmental variables. It is now recognised that re-regenerative treatment of periodontal defects with an agent or procedure, requires that each functional stage of reconstruction be grounded in a biologically directed process. With such considerations it is now more apparent that the seminal work of Karring, Nyman and coworkers from Gothenburg in Sweden led to the development of guided tissue regeneration (GTR) as a treatment modality. While GTR had advance it became evident that while periodontal regeneration was clinically possible it was clinically very difficult to achieve on a reliable basis owing to a vast range of patient and operator variables.

More recently we have seen the development of biological agents and preparations which, when applied onto root surfaces, can result in significant regeneration of damaged periodontal tissues. The use of such agents offers simplified approach to periodontal regeneration with equivalent, and sometimes superior, results compared to GTR procedures. However, as has been noted for GTR, the clinical outcome using biological agents can be variable and further work is needed to improve their clinical utility. Moreover, the use of mesenchymal stem cells and genetic modulation of periodontal cells have been explored for the purposes of achieving periodontal regeneration. The future looks promising but no doubt there is a considerable amount of work to be done before reliable and predictable periodontal regeneration becomes a reality.  

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