Editorial

Integrating epigenetics in modern periodontology – Current concepts

Periodontitis is a chronic disease initiated by a representative, multifactorial, and bacterial challenge of microorganisms and inflammation, usually with genetic and epigenetic factors, in the host. It is well known in dentistry that oral bacteria in dental plaque induce periodontal disease and that the resulting progression is associated with several risk factors, such as genetics, lifestyle, and systemic disease. Epigenetic is derived from the Greek word first used by Conrad Waddington in 1942,[1] which means the study changes that do not entail a change in the sequence of DNA is a new scientific discipline in science that is revolutionizing biology. In simple words, its form can be understood as whenever two genetically identical individuals are nonidentical, which we can measure this phenomenon is known as epigenetic. The study of epigenetic characteristics is being extensively researched in medical education today, but the study of epigenetic characteristics in dental research is still in its infancy. Nevertheless, studies related to epigenetics in dentistry deserve attention because epigenetic mechanisms play an important role in the development of oral diseases and gene expression during oral disease processes.

Related published articles conclude that various epigenetic factors (inflammation-immune response, connective tissue-bone destruction)[2] may induce dental differences due to epigenetic modification in monozygotic twin pairs and that epigenetic modification (such as DNA methylation, histone modifications, and noncoding RNA) in the genome may affect various gene functions that can lead to various periodontal diseases, dental abnormalities during the tooth developmental stage, etc., Several studies have reported that inflammatory responses in infected pulp and periodontal tissue affect epigenetic modifications, leading to changes in gene expression.

Although comprehensive understanding, studies of periodontal disease focused on epigenetics in dentistry are still in the early stages. More evidence is needed to associate epigenetic alterations, periodontal diseases, and inflammatory dental pulp cells. Several trials are being conducted to identify as well as epi-drugs for the treatment and prevention of periodontal disease. Although these advances have not yet been realized in clinical settings, identifying biomarkers for diagnosis is warranted.

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