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Editorial

Genetic studies and orthodontics

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Genetics is the science of potential which will transfer biological information from parents to off springs and generation to generation. Malocclusion is not a disease but deviation from normal occlusion. It is influenced by both genetic and environmental interaction factors. Understanding the genetic factors contributing to the variation in dentofacial morphology associated with malocclusions is the key for proper diagnosis which, in turn, helps to develop novel treatment techniques.

Genetics has been one of the explanatory cause of malocclusion, probably the best known example is the House of Hapsburg- King and Emperor of Bohemia. The prognathic mandible was inherited as a malocclusion for many generations.

During past 20 years, significant advancement and understanding about genomic basis of craniofacial development has evolved. Harris and Johnson concluded that the heritability of skeletal characteristics was relatively higher compared to the dental characteristics. For example. Long face pattern inheritance is most common. However the extent of which type of malocclusion is related to the genetic influence is still less clear.

So, it is important to consider genetic factor in diagnosis and knowledge about genetics and environment will enhance the ability to plan the orthodontic treatment.

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Advances in dentofacial phenotyping, which is the comprehensive characterization of hard- and soft-tissue variation in the craniofacial complex, together with the acquisition of large-scale genomic data have started to unravel genetic mechanisms underlying facial variation. Knowledge of the genetics of human malocclusion is limited even though results attained thus far are encouraging, with promising opportunities for future research.

Various studies like Genetic Influence on Skeletal Relationship of Jaws, Vertical Skeletal Jaw Abnormalities, Genetic Effects on Individual Tooth Variations, Effects of Genetics on Inheritance of Malocclusion, Genetic Effects on External Apical Root resorption, Genetic Implications on Orthodontic Tooth Movement have been carried out in last two decades.

Many genetic factors and how they are related to environmental (including treatment) factors are being investigated and are starting to be better understood. While precise prediction is not at hand, the influence of genetic factors for example in EARR is clear.


As the recognition of specific genetic factors that affect our patients are discovered, the three-generation history /family history can be implemented in the orthodontic practice today. This would greatly benefit the patient at that time, and augment the usefulness of these families in future clinical research in which clinical findings, environmental, and genetic factors can be studied.

Conflict of Interest

None.

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