

Environmental Factors' Effects on Dental Caries

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ABOUT THE STUDY

The phrase "dental caries" covers both the condition and the subsequent lesion. The biofilm, which is constantly active with every pH change, is where the caries process takes place, and the lesion develops in the tooth hard tissues. Due to the frequent ingestion of carbohydrates, the biofilm microbiota that typically maintains homeostasis in the oral cavity transforms into an acidogenic, aciduric, and cariogenic population, which results in dental caries. This change can have clinically imperceptible effects or cause a net loss of minerals in the tooth's hard structures, which manifests as a noticeable carious lesion. Without dental caries, a visible lesion cannot exist.

As a result, dental caries is seen as a dietary-microbial disease that necessitates the development of a cariogenic biofilm as well as regular exposure to fermentable carbohydrates (glucose, fructose, maltose, and sucrose) in the diet. Additionally, behavioral, psychological, and social aspects are very important in the development of the condition. The ability of fluoride to prevent tooth decay is widely established, and inadequate fluoride exposure should be seen as a contributing component in the development of the illness.

Genetics is a subfield of biology that studies the laws or concepts governing inheritance. It looks into the transmission of genetic information from one generation to the next. It also discusses how a person's internal and external environments interact. Dental caries is simply one of the numerous complicated dental diseases brought on by hereditary, environmental, and pathogenic microbiological causes. The combination of several etiological factors, some of which favour demineralization and others which aid in remineralization, results in dental caries, a dynamic, reversible process.

Since some genes can increase your susceptibility to certain diseases while others can protect you from them, your genetic make-up can have a significant impact on the microbial make-up of your body. Dental caries is a complex pathology that involves a dynamic process involving bacteria, a cariogenic diet, and host vulnerability. For instance, HLA genes affect the host's immunological response, which is connected to oral colonisation by Mutans Streptococcus. MHC genes may affect a person's

vulnerability to developing MS. According to twin research, the incidence of caries is the same in monozygotic twins. Family members maintain the same eating and oral hygiene practises while residing in the same home.

Heritability estimate calculation helps in quantification of genetic contribution to phenotypes. There are two varieties of heritability

- Narrow-sense
- Broad-sense heritability.

Narrow-sense heritability deals with the contributions of extra genetic variations to phenotypes, whereas broad-sense heritability deals with the total genetic contribution to phenotypic determination. While additive effects show parental genetic influence on a child's traits, non-additive effects focus on genetic dominance and gene-gene interactions.

How closely related traits in genetically related subjects differ from one another is determined *via* linkage analysis. If a statistical correlation between the two can be established, it can be deduced that particular genes contribute to the genetic similarity. Linkage analysis was used to identify the chromosomal position of the focal gene. Candidates are the genes that have functions.

Dental caries develops when organic acids produced by bacteria in dental plaque as a result of their anaerobic metabolism of sugars and other fermentable carbohydrates obtained from the diet demineralize enamel and dentin, the hard tissues of the teeth. Organic acids make calcium hydroxyapatite more soluble in dental hard tissues, and calcium loss causes demineralization of the tooth surface.

The peak ages for dental caries are 2-5 years for the deciduous dentition and early adolescence for the permanent dentition because teeth are most susceptible to dental caries shortly after erupting. Adolescence is the time when permanent teeth start to erupt and fill up the dental arch. The onset of various oral disorders is critical at this age. The facial profile and aesthetic look are changing due to dental caries, periodontal disease, and orthodontic issues including overcrowding or malocclusions.

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