Abstract

Dental enamel, containing up to 96% mineral content, is considered the hardest material in the human body. Due to the periodic nature of its growth during tooth development, it serves as a permanent record of developmental conditions at corresponding ages. Because of its resistance to post-depositional changes, it is also a useful source of information in bioarchaeology, where the growth and development of past populations can be reconstructed. During tooth formation, defects can occur, with enamel hypoplasia being the most common. Enamel hypoplasia, studied using both macroscopic and microscopic methods, is a key indicator of stress events and their long-term impacts on the health of historical populations. Macroscopic methods involve visual and tactile examination of specimens and provide a quick overview of the presence of hypoplasia and the basic characteristics of defects. In contrast, microscopic methods allow detailed analysis of the enamel microstructure, including assessment of prenatal stress. Application studies focusing on hypoplastic defects in bioarchaeology show their negative impact on life expectancy, and they are also an auxiliary indicator to better understand differences in dietary habits depending on health status, socioeconomic status, or migration of historical populations. Dental enamel hypoplasia can be considered a universal indicator of stress and malnutrition, with specific causes varying according to the environment, cultural practices and social structure of populations. However, the relationship between the presence of a defects and poorer living conditions is not straightforward, and the issue is further complicated by the so-called osteological paradox.

Keywords:

Enamel, hypoplasia, Barker hypothesis, health status of past populations, stress