МЕДИЦИНА, ПЕДАГОГИКА И ТЕХНОЛОГИЯ: ТЕОРИЯ И ПРАКТИКА
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DENTAL DISEASES IN ANCIENT POPULATIONS: EVIDENCE FROM ARCHAEOLOGICAL FINDINGS

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Abstract

Dental diseases have affected human populations since prehistoric times, reflecting complex interactions between diet, environment, culture, and biological adaptation. Archaeological dental evidence provides invaluable insights into the health, lifestyle, and social organization of ancient populations. This article examines the prevalence, types, and causes of dental diseases in ancient populations based on archaeological findings, including skeletal remains, dental wear patterns, caries, periodontal disease, enamel hypoplasia, and dental trauma. Using an interdisciplinary approach that integrates dental anthropology, bioarchaeology, and paleopathology, the study explores how dietary transitions, socioeconomic structures, and cultural practices influenced oral health across different historical periods. The findings demonstrate that dental diseases serve as critical indicators of broader health conditions and living standards in ancient societies. Understanding these patterns contributes to both historical knowledge and modern perspectives on oral health prevention and disease etiology.

Keywords: Dental Diseases, Ancient Populations, Archaeological Evidence, Dental Anthropology, Paleopathology

1. Introduction

Dental diseases are among the most common health conditions affecting humans across all historical periods. Unlike many soft tissues that deteriorate after death, teeth are highly durable, often surviving for thousands of years in archaeological contexts. This

durability makes dental remains one of the most reliable sources for reconstructing health, diet, and lifestyle in ancient populations.

The study of dental diseases in archaeological populations provides critical insights into the biological and cultural evolution of humanity. Dental pathologies such as caries, periodontal disease, tooth wear, abscesses, and developmental defects reflect long-term interactions between genetic predispositions, dietary habits, environmental stressors, and cultural practices. Consequently, dental health serves as a proxy for understanding broader aspects of ancient life, including nutrition, social inequality, occupational stress, and disease burden.

The aim of this article is to analyze dental diseases in ancient populations through archaeological evidence, focusing on their prevalence, etiology, and historical significance. By examining dental remains from prehistoric to early historic societies, this study seeks to identify patterns and transitions in oral health associated with major cultural developments such as the adoption of agriculture, urbanization, and social stratification.

2. Literature Review

The investigation of dental diseases in ancient populations has a long tradition within physical anthropology and archaeology. Early studies primarily focused on descriptive classifications of dental pathologies, while contemporary research emphasizes interpretative frameworks linking oral health to broader socio-cultural and environmental contexts.

Pioneering works by scholars such as Guerini and Brothwell laid the foundation for dental paleopathology by systematically documenting dental caries, wear, and periodontal disease in skeletal assemblages. Subsequent research expanded methodological approaches, incorporating microscopic analysis, isotopic studies, and comparative population-based assessments.

Studies consistently show that dental disease prevalence varies significantly across time and space. Hunter-gatherer populations generally exhibited low caries rates but extensive tooth wear due to abrasive diets. In contrast, agricultural societies experienced a dramatic increase in dental caries associated with carbohydrate-rich diets and food processing techniques.

Research on ancient Egyptian, Roman, and medieval European populations reveals high levels of periodontal disease and tooth loss, often linked to poor oral hygiene and nutritional deficiencies. Enamel hypoplasia has been widely studied as an indicator of childhood stress, reflecting episodes of malnutrition or systemic illness during tooth development.

Recent literature emphasizes the role of dental disease as a marker of social inequality. Elite individuals often show better oral health outcomes than lower-status groups, suggesting differential access to food resources and healthcare. Overall, the literature underscores the value of dental evidence as a multifaceted tool for reconstructing ancient human health and behavior.

3. Methodology

This study employs a qualitative and comparative bioarchaeological research methodology. Data were synthesized from published archaeological reports, peer-reviewed journal articles, and monographs focusing on dental remains from prehistoric and historic populations.

The methodological framework includes:

Macroscopic examination of dental remains to identify caries, wear, abscesses, and antemortem tooth loss

Microscopic and radiographic interpretations reported in the literature to assess enamel defects and internal pathology

Comparative population analysis across different subsistence strategies and time periods

The study integrates dental anthropology and paleopathology to interpret observed dental conditions within their cultural and environmental contexts. Emphasis was placed on avoiding presentist bias by analyzing dental diseases relative to the technological and dietary constraints of ancient societies.

4. Results

4.1 Dental Caries in Ancient Populations

Dental caries is one of the most extensively studied oral diseases in archaeological contexts. Evidence suggests that caries prevalence was relatively low among

Paleolithic hunter-gatherers due to diets rich in protein and low in fermentable carbohydrates. However, with the advent of agriculture during the Neolithic period, caries rates increased markedly.

Archaeological findings from early farming communities reveal higher incidences of carious lesions, particularly on molars and premolars. This increase is attributed to the consumption of domesticated cereals and processed foods, which promote plaque formation and bacterial activity.

4.2 Periodontal Disease and Tooth Loss

Periodontal disease is commonly observed in ancient skeletal remains, characterized by alveolar bone resorption and antemortem tooth loss. Studies indicate that periodontal disease prevalence increased with age and was exacerbated by poor oral hygiene and chronic inflammation.

In many ancient populations, tooth loss significantly affected mastication and nutrition, potentially contributing to systemic health decline. Archaeological evidence from Roman and medieval cemeteries shows widespread periodontal disease, suggesting limited preventive dental care.

4.3 Dental Wear and Attrition

Severe dental wear is a hallmark of many ancient populations. Hunter-gatherers and early agriculturalists often consumed coarse, unprocessed foods containing grit and abrasive particles. Additionally, teeth were frequently used as tools for processing materials, further accelerating wear.

Extreme attrition sometimes exposed dental pulp, leading to infections and abscess formation. Despite this, some populations adapted biologically, with compensatory tooth eruption helping maintain occlusion.

4.4 Enamel Hypoplasia and Developmental Stress

Enamel hypoplasia appears as linear defects or pits on tooth surfaces and reflects physiological stress during childhood. High frequencies of enamel hypoplasia in archaeological populations indicate widespread episodes of malnutrition, infectious disease, or environmental hardship.

Comparative studies show higher rates of enamel hypoplasia in urbanized and socially stratified societies, highlighting the impact of inequality on childhood health.

4.5 Dental Trauma and Cultural Practices

Dental trauma is frequently documented in ancient skeletal remains, resulting from interpersonal violence, accidents, or occupational hazards. In some cultures, intentional dental modification—such as filing, inlaying, or extraction—served social or ritual purposes.

Such practices provide valuable insight into identity, aesthetics, and cultural norms, demonstrating that dental conditions were not solely pathological but also socially constructed.

5. Discussion

The archaeological evidence clearly demonstrates that dental diseases were widespread and varied significantly depending on subsistence strategy, environment, and social organization. The transition from foraging to farming represents a critical turning point in oral health history, marked by increased caries and periodontal disease.

Dental pathologies reflect broader health patterns, including nutritional deficiencies and chronic stress. Importantly, oral health disparities observed in ancient populations parallel modern inequalities, underscoring the persistent link between social conditions and health outcomes.

The findings also challenge simplistic narratives of progress, revealing that technological advancements often introduced new health challenges. Understanding these historical patterns provides valuable lessons for contemporary public health and preventive dentistry.

6. Conclusion

Dental diseases in ancient populations offer a unique window into the biological and cultural history of humanity. Archaeological dental evidence reveals how shifts in diet, lifestyle, and social structure shaped oral health across millennia.

This study highlights the importance of integrating dental anthropology into broader historical and medical research. By examining ancient dental diseases, modern dentistry can gain deeper insights into disease etiology, prevention strategies, and the long-term consequences of dietary and environmental change.

Ultimately, the past informs the present, and the study of ancient dental diseases contributes meaningfully to our understanding of human health evolution.

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