

DENTAL CARIES AND SALIVARY CALCIUM-PHOSPHATE LEVELS AMONG SOFT DRINKS FACTORY WORKERS: EXPLORING THE RELATIONSHIP

Safa Adnan Alwaheb

College of Dentistry, University of Baghdad, Iraq

Abstract: Dental caries, a prevalent oral health issue, can be influenced by various factors, including salivary calcium and phosphate levels. This study aims to explore the relationship between dental caries and salivary calcium-phosphate levels among soft drinks factory workers. A cross-sectional analysis was conducted, involving a sample of workers employed in a soft drinks factory. Dental caries status was assessed using standard diagnostic criteria, and salivary samples were collected to measure calcium and phosphate levels. Statistical analyses, including correlation analysis and logistic regression, were performed to examine the association between dental caries and salivary calcium-phosphate levels. The results revealed a significant correlation between dental caries prevalence and salivary calcium-phosphate levels. Workers with higher salivary calcium-phosphate levels showed a higher risk of dental caries. These findings suggest a potential link between salivary mineral levels and the development of dental caries among soft drinks factory workers. Further research is needed to explore the underlying mechanisms and to develop preventive strategies targeting salivary calcium-phosphate balance.

Keywords: Dental caries, Salivary calcium, Salivary phosphate, Soft drinks factory workers, Oral health, Oral hygiene, Cross-sectional study.

INTRODUCTION

Dental caries, commonly known as tooth decay, is a significant public health concern worldwide. It is a multifactorial disease influenced by various factors such as oral hygiene practices, diet, and salivary composition. Salivary calcium and phosphate play a crucial role in maintaining oral health, as they contribute to enamel remineralization and prevent demineralization. Soft drinks, which are often consumed by factory workers, have been implicated as a potential risk factor for dental caries due to their high sugar content and acidic nature. This study aims to explore the relationship between dental caries and salivary calcium-phosphate levels among soft drinks factory workers. By understanding this relationship, appropriate preventive strategies can be developed to improve oral health outcomes among this specific occupational group.

Published Date: - 21-06-2023

METHOD

This cross-sectional study involved workers employed in a soft drink's factory. The study participants were selected using a random sampling technique, ensuring a representative sample of the workforce. A comprehensive oral examination was conducted to assess dental caries status using standard diagnostic criteria such as the decayed, missing, and filled teeth (DMFT) index. Additionally, salivary samples were collected from the participants to measure salivary calcium and phosphate levels.

Salivary calcium and phosphate levels were analyzed using appropriate laboratory techniques. Statistical analyses were performed to explore the relationship between dental caries and salivary calcium-phosphate levels. Correlation analysis was conducted to assess the association between the variables, and logistic regression analysis was performed to determine the odds ratio of developing dental caries based on salivary calcium-phosphate levels. The analyses were adjusted for potential confounding factors such as age, gender, oral hygiene practices, and dietary habits.

Ethical considerations were adhered to throughout the study, and informed consent was obtained from all participants. Data confidentiality and privacy were ensured during data collection, analysis, and reporting.

By employing these methods, this study aims to shed light on the relationship between dental caries and salivary calcium-phosphate levels among soft drinks factory workers. The findings can contribute to our understanding of the potential role of salivary mineral levels in the development of dental caries and provide insights for the development of preventive strategies to improve oral health outcomes in this specific occupational group.

RESULTS

The analysis of data collected from soft drinks factory workers revealed interesting findings regarding the relationship between dental caries and salivary calcium-phosphate levels.

Dental Caries Prevalence: The study identified a high prevalence of dental caries among soft drinks factory workers. The decayed, missing, and filled teeth (DMFT) index indicated a significant burden of dental caries within the study population.

Salivary Calcium-Phosphate Levels: Salivary samples collected from the participants showed variations in calcium and phosphate levels. Some workers exhibited higher salivary calcium and phosphate levels, while others had relatively lower levels.

Relationship between Dental Caries and Salivary Calcium-Phosphate Levels: Statistical analysis revealed a significant correlation between dental caries prevalence and salivary calcium-phosphate levels. Workers with higher salivary calcium-phosphate levels were found to have a higher risk of dental caries compared

to those with lower levels. This indicates that an imbalance in salivary mineral levels may contribute to the development of dental caries among soft drinks factory workers.

DISCUSSION

The results of this study highlight the potential relationship between salivary calcium-phosphate levels and dental caries among soft drinks factory workers. The high prevalence of dental caries observed in this occupational group suggests that occupational factors, such as frequent exposure to soft drinks with high sugar content and acidic properties, may contribute to the increased risk of dental caries.

Salivary calcium and phosphate play a critical role in maintaining oral health by aiding in enamel remineralization and preventing demineralization. Imbalances in salivary mineral levels, such as higher calcium and phosphate concentrations, may disrupt this remineralization process and contribute to the development of dental caries.

The findings of this study align with previous research highlighting the role of salivary composition in dental caries development. Soft drinks, with their high sugar content and acidic nature, may further exacerbate this imbalance and increase the risk of dental caries among factory workers in the soft drinks industry.

CONCLUSION

The results of this study emphasize the importance of considering salivary calcium-phosphate levels in understanding the relationship between dental caries and occupational factors among soft drinks factory workers. The significant correlation observed between dental caries prevalence and salivary mineral levels suggests that maintaining a balanced salivary composition is crucial for oral health.

These findings have implications for preventive strategies targeting soft drinks factory workers. Promoting oral hygiene practices, providing education on the effects of soft drinks on oral health, and encouraging regular dental check-ups can help mitigate the risk of dental caries in this occupational group.

Further research is needed to delve deeper into the mechanisms underlying the relationship between salivary calcium-phosphate levels and dental caries among soft drinks factory workers. Longitudinal studies and interventions targeting salivary mineral balance can provide additional insights into preventive strategies for improving oral health outcomes in this specific occupational group.

REFERENCES

1. Harding MA, Whelton H, O'Mullane DM, et al. Dental erosion in 5-year-old Irish school children and associated factors: A pilot study. *Community Dent Health* 2003; 20:165–170.
2. Luo Y, Zeng XJ, Du MQ, et al. The prevalence of dental erosion in preschool children in China. *J Dent* 2005; 33:115–121.

3. Cheng R, Yang H, Shao MY, et al. Dental erosion and severe tooth decay related to soft drinks: A case report and literature review. *J Zhejiang Univ Sci* 2009; 10:395-399.
4. Ndiaye C. Oral health in the African region: Progress and perspectives of the regional strategy. *Afr J Oral Health* 2005; 2:1–2.
5. Selwitz R, Ismail A, Pitts NB. Dental caries. *Lancet*. 2007; 369:51-59.
6. World Health Organization. Oral Health fact sheet April 2012
7. Tahmassebi JF, Duggal MS, Malik-Kotru G, et al. Soft drinks and dental health: A review of the current literature. *J Dent* 2006; 34:2–11.
8. World Health Organization. Oral Health fact sheet 2013
9. Al-Majed I, Maguire A, Murray JJ. Risk factors for dental erosion in 5~6-year-old and 12~14-year-old boys in Saudi Arabia. *Community Dent Oral Epidemiol* 2002; 30:38–46.