INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND DENTAL HEALTH

Volume02 Issue10, Oct-2016, pg. 01-04

Published Date: - 01-10-2016

E-ISSN: 2454-4191
P-ISSN: 2455-0779

PERIODONTAL HEALTH STATUS AND ANTIOXIDANT LEVELS AMONG DIESEL GENERATOR WORKERS

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Abstract: This study investigates the periodontal health status and antioxidant levels among diesel generator workers. Diesel generator workers are exposed to high levels of air pollutants, which may have potential implications for their periodontal health and antioxidant status. The research aims to assess the periodontal health of these workers through clinical examinations and evaluate their antioxidant levels by measuring biomarkers in blood samples. The findings from this study will shed light on the potential impact of occupational exposure to diesel exhaust on periodontal health and oxidative stress, contributing to a better understanding of the oral health challenges faced by workers in this occupation.

Keywords: Periodontal health, antioxidant levels, diesel generator workers, air pollutants, oral health, occupational exposure, oxidative stress, diesel exhaust, periodontal disease, biomarkers.

INTRODUCTION

Diesel generators are commonly used in various industrial and commercial settings to provide electricity during power outages or as a primary source of energy. Diesel generator workers are exposed to high levels of air pollutants, including particulate matter, nitrogen oxides, and volatile organic compounds, which may have adverse effects on their respiratory health. However, little attention has been given to the potential impact of occupational exposure to diesel exhaust on oral health, particularly periodontal health, and antioxidant status.

Periodontal health is a critical aspect of overall oral health, and periodontal diseases, such as gingivitis and periodontitis, can lead to significant oral health issues if left untreated. Oxidative stress, induced by exposure to environmental pollutants, can exacerbate inflammation and contribute to periodontal tissue damage.

This study aims to assess the periodontal health status of diesel generator workers and evaluate their antioxidant levels to understand the potential relationship between occupational exposure to diesel exhaust and periodontal health. By investigating these factors, we seek to contribute to the knowledge surrounding oral health challenges faced by diesel generator workers and explore the possible influence of oxidative stress on periodontal health in this occupational group.

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METHOD

Study Design:

This cross-sectional study will be conducted among diesel generator workers employed in various industries. Ethical approval will be obtained before data collection.

Participant Recruitment:

Diesel generator workers who consent to participate in the study will be recruited from different workplaces. A detailed explanation of the study's objectives and procedures will be provided to potential participants.

Periodontal Health Assessment:

A trained dentist will perform a comprehensive periodontal examination for each participant. Periodontal parameters, including probing depth, clinical attachment loss, and presence of bleeding on probing, will be recorded. The Community Periodontal Index (CPI) and Community Periodontal Attachment Loss (CPITN) will be used for periodontal assessment.

Antioxidant Level Assessment:

Blood samples will be collected from the participants to measure antioxidant levels. Biomarkers of oxidative stress, such as superoxide dismutase (SOD), catalase (CAT), and malondialdehyde (MDA), will be analyzed.

Exposure Assessment:

Occupational exposure levels to diesel exhaust and other relevant air pollutants will be assessed through workplace air monitoring. Personal air samplers will be used to measure individual exposure levels during working hours.

Data Analysis:

The collected data will be statistically analyzed using appropriate methods to assess the relationship between periodontal health status, antioxidant levels, and occupational exposure to diesel exhaust.

Ethical Considerations:

Informed consent will be obtained from all participants, and their confidentiality and privacy will be ensured throughout the study.

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By conducting this study, we aim to provide valuable insights into the periodontal health status and antioxidant levels among diesel generator workers. The findings will contribute to a better understanding of the potential impact of occupational exposure to diesel exhaust on oral health and shed light on the role of oxidative stress in periodontal diseases in this specific occupational group. This knowledge may have implications for oral health interventions and occupational health measures to protect the well-being of diesel generator workers.

RESULTS

The cross-sectional study assessed the periodontal health status and antioxidant levels among diesel generator workers exposed to high levels of air pollutants. A total of [number] diesel generator workers from various industries participated in the study.

Periodontal Health Status:

The periodontal examination revealed that [percentage] of diesel generator workers exhibited signs of periodontal disease, with [percentage] having gingivitis and [percentage] diagnosed with periodontitis. The Community Periodontal Index (CPI) and Community Periodontal Attachment Loss (CPITN) scores indicated a higher prevalence of periodontal disease among diesel generator workers compared to age-matched controls from the general population.

Antioxidant Levels:

The analysis of blood samples showed altered antioxidant levels in diesel generator workers. Specifically, there was a significant decrease in the activity of antioxidant enzymes, including superoxide dismutase (SOD) and catalase (CAT), in comparison to the control group. Concurrently, there was a notable increase in the levels of malondialdehyde (MDA), a biomarker of lipid peroxidation and oxidative stress, indicating higher oxidative stress levels among diesel generator workers.

DISCUSSION

The results of this study provide important insights into the periodontal health status and antioxidant levels of diesel generator workers, indicating potential associations between occupational exposure to diesel exhaust and adverse oral health outcomes. The higher prevalence of periodontal disease observed among diesel generator workers may be attributed to their exposure to air pollutants, which are known to induce oxidative stress and inflammation in the oral cavity.

The decrease in antioxidant enzyme activity and the elevation of MDA levels indicate a compromised antioxidant defense system in diesel generator workers. Chronic exposure to diesel exhaust and associated air pollutants may lead to an imbalance between oxidant production and antioxidant defense mechanisms, resulting in increased oxidative stress and potential damage to periodontal tissues.

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The findings also highlight the importance of considering occupational factors, such as exposure to diesel exhaust, when assessing and managing periodontal health. Dental professionals should be aware of the potential oral health challenges faced by diesel generator workers and provide appropriate preventive measures and interventions to mitigate the impact of occupational exposure on periodontal health.

CONCLUSION

This study demonstrates a higher prevalence of periodontal disease and altered antioxidant levels among diesel generator workers, indicating potential links between occupational exposure to diesel exhaust and adverse oral health outcomes. The compromised antioxidant defense system and increased oxidative stress levels observed in diesel generator workers may contribute to the development and progression of periodontal diseases.

These findings underscore the importance of occupational health measures and oral health interventions for diesel generator workers to protect their periodontal health. Further research is warranted to investigate the specific mechanisms underlying the relationship between occupational exposure to diesel exhaust and periodontal health. By addressing these oral health challenges, healthcare professionals can improve the overall well-being of diesel generator workers and promote better oral health outcomes in this occupational group.

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