

SCREENING AND ANTIBIOTIC SENSITIVITY PROFILING OF TARTAR-FORMING BACTERIA FROM DENTAL PLAQUE

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Abstract: Dental plaque serves as a reservoir for diverse bacterial species, including those involved in the formation of tartar (dental calculus). As tartar contributes to various oral health issues, including gum disease, understanding the antibiotic sensitivity profile of tartar-forming bacteria is essential for developing effective therapeutic strategies. This study aimed to screen and assess the antibiotic sensitivity patterns of tartar-forming bacteria isolated from dental plaque samples. Dental plaque samples were collected from [specify location] of [specify number] participants. The isolated bacteria were subjected to antibiotic susceptibility testing using standardized methods. The results revealed the prevalence of various bacterial species associated with tartar formation, along with their respective antibiotic sensitivity patterns. This study provides valuable insights into the antibiotic susceptibility of tartar-forming bacteria, aiding in the development of targeted antibiotic therapies for managing oral health conditions related to dental plaque and tartar.

Keywords: Dental plaque, tartar, dental calculus, antibiotic sensitivity, antibiotic susceptibility testing, tartar-forming bacteria, oral health, gum disease, antimicrobial therapy, oral microbiome.

INTRODUCTION

Dental plaque is a complex biofilm that develops on tooth surfaces, harboring a diverse community of microorganisms. Among the various bacteria present in dental plaque, certain species play a crucial role in the formation of tartar or dental calculus. Tartar is a mineralized deposit that adheres to tooth surfaces and can lead to various oral health issues, such as gingivitis and periodontitis. To effectively manage these oral health conditions, it is essential to understand the antibiotic sensitivity profile of tartar-forming bacteria. Knowledge of the antibiotic susceptibility patterns can guide the development of targeted antimicrobial therapies, ensuring effective control of tartar-related oral diseases. Thus, this study aimed to screen and assess the antibiotic sensitivity patterns of tartar-forming bacteria isolated from dental plaque samples.

METHOD

Sample Collection:

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Dental plaque samples were collected from [specify location, e.g., buccal surfaces of molars] of [specify number] participants visiting the dental clinic/hospital for routine check-ups or periodontal treatment. Informed consent was obtained from all participants before sample collection. Patients with a history of recent antibiotic use were excluded to avoid potential confounding factors.

Isolation and Identification of Tartar-Forming Bacteria:

The collected dental plaque samples were immediately transferred to the laboratory for processing. The samples were streaked onto selective and differential agar media, such as blood agar and Mitis Salivarius Bacitracin (MSB) agar, to encourage the growth of oral microorganisms, including tartar-forming bacteria. The isolated bacterial colonies were subjected to Gram staining and biochemical tests for identification.

Antibiotic Susceptibility Testing:

The identified tartar-forming bacteria were then subjected to antibiotic susceptibility testing using the Kirby-Bauer disk diffusion method. Standardized antibiotic discs were placed on Mueller-Hinton agar plates inoculated with the bacterial isolates. The plates were incubated at the appropriate temperature for 24 hours, and the zones of inhibition around each antibiotic disc were measured.

Data Analysis:

The results of antibiotic susceptibility testing were interpreted according to Clinical and Laboratory Standards Institute (CLSI) guidelines. The zones of inhibition were categorized as sensitive, intermediate, or resistant for each antibiotic tested. The prevalence of tartar-forming bacteria and their respective antibiotic susceptibility patterns were analyzed and presented as percentages.

Ethical Considerations:

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Institutional Review Board (IRB) or Ethics Committee. All participants provided informed consent before participating in the study.

The screening and antibiotic sensitivity profiling of tartar-forming bacteria from dental plaque will provide valuable insights into the bacterial composition of tartar deposits and their response to antibiotic treatment. The findings of this study will contribute to our understanding of the antimicrobial susceptibility patterns of tartar-forming bacteria, facilitating the development of targeted antimicrobial therapies for managing oral health conditions associated with dental plaque and tartar. By addressing the specific antibiotic sensitivity of these bacteria, we aim to improve oral health outcomes and enhance the effectiveness of antimicrobial interventions for patients with tartar-related oral diseases.

RESULTS

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A total of [specify number] dental plaque samples were collected from [specify location] of [specify number] participants. The isolated bacterial species associated with tartar formation included [specify bacterial species], among others. Antibiotic susceptibility testing revealed varying patterns of antibiotic sensitivity among the identified tartar-forming bacteria.

Antibiotic Susceptibility Patterns:

The antibiotic susceptibility testing showed that some tartar-forming bacteria were sensitive to a wide range of antibiotics, while others exhibited resistance to certain antibiotics. [Specify bacterial species] demonstrated high sensitivity to [specify antibiotics], making them potential candidates for targeted antimicrobial therapy.

Prevalence of Tartar-Forming Bacteria:

Among the isolated bacterial species, [specify bacterial species] were the most prevalent, accounting for [specify percentage] of the total isolates. This highlights the significance of [specify bacterial species] in tartar formation and associated oral health issues.

DISCUSSION

The results of this study provide valuable insights into the antibiotic sensitivity patterns of tartar-forming bacteria isolated from dental plaque. Understanding the antibiotic susceptibility of these bacteria is essential for developing effective treatment strategies to control tartar-related oral diseases.

The presence of diverse bacterial species associated with tartar formation underscores the complexity of dental plaque biofilms and their role in oral health. The prevalence of [specify bacterial species] indicates their potential involvement in tartar formation and reinforces the importance of targeting these bacteria in antimicrobial therapies.

The variable antibiotic sensitivity among tartar-forming bacteria necessitates careful consideration when prescribing antibiotics for oral health conditions related to tartar. The sensitivity data will aid dental practitioners in selecting appropriate antibiotics for specific patients to achieve successful treatment outcomes.

CONCLUSION

The screening and antibiotic sensitivity profiling of tartar-forming bacteria from dental plaque provided valuable insights into the prevalence and antibiotic susceptibility patterns of these bacterial species. The results of this study highlight the importance of targeted antimicrobial therapy for managing oral health conditions associated with dental plaque and tartar.

By understanding the antibiotic sensitivity of tartar-forming bacteria, dental professionals can tailor treatment regimens to effectively control tartar-related oral diseases and minimize the risk of antibiotic

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resistance. This knowledge contributes to the advancement of oral healthcare practices and supports evidence-based decision-making in dental treatment planning.

Future research can explore the molecular mechanisms of antibiotic resistance in tartar-forming bacteria and investigate the impact of targeted antimicrobial therapy on oral health outcomes. Continuous surveillance of antibiotic susceptibility in these bacteria is crucial for maintaining the effectiveness of antimicrobial treatments and promoting oral health in the long term.

In conclusion, the findings of this study contribute to a better understanding of the antibiotic sensitivity of tartar-forming bacteria from dental plaque and lay the groundwork for the development of personalized antimicrobial therapies for patients with tartar-related oral health conditions.

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