Isolation Identification of Bacterial, Fungal Pathogens from Periodontitis, Prosthodontitis and Denture Patients. Oral Microbiology

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Abstract

Background: Periodontist and prosthodontitis dental patients were mostly associated with cardiovascular diseases.

Aim: To study about bacterial and fungal pathogens associated with periodontitis, periodontitis and their antibiotic sensitivity pattern

Materials and Methods: A total of 125 Dental patients were selected, they were associated with severe periodontitis, prosthodontitis and denture cases. Sampling, gingival aspirations, oral ulcer swabs were collected and processed for the identification of pathogens. The isolated pathogen is also tested against various types of antibiotics.

Result: The total of 125 patient, 45 cases were associated with periodontitis, 55 cases were associated with prosthodontitis and 25 cases were having diabetes with denture. Out of 45 periodontitis cases 25 were isolated *Staphylococcus aureus*, 10 cases showed the presence of *Porphyromonas gingivalis* and 10 patients were isolated *Streptococcus faecalis*.

Out of 55 cases of prosthodontitis 23 cases showed the isolation of *Streptococcus pyogenes*, 27 cases were isolated *Staphylococcus aureus*, 5 cases were isolated *Candida albicans*.

25 patients were associated with diabetes mellitus having denture, all these patients were isolated predominantly *Candida albicans*.

Conclusion: This study concludes both periodontitis, prosthodontitis and denture cases were showed the presence of predominant pathogens like *Staphylococcus aureus, Streptococcus pyogenes* 60%. The *Porphyromonas gingivalis, Streptococcus faecalis* and *Candida albicans* were also Isolated about 10%.

Keywords: Staphylococcus aureus; Streptococcus pyogenes; Porphyromonas gingivalis; Streptococcus faecalis; Candida albicans

Introduction

Oral microorganisms are associated with oral and systemic infections. Oral hygiene has been considered as most important at present in any population [REF]. A harmonious relationship between normal oral microbial flora with oral cavity is observed in healthy oral hygiene individual. Most of periodontal, prosthodontal infection has been reported to be associated with systemic infections such as cardiovascular diseases Like endocarditis, myocardial Infraction, and coronary artery disease. Other infections include respiratory tract infection, preterm low birth weight babies, and diabetes mellitus.

Periodontitis is a condition has been associated with infection, inflammation of periodontal ligament and gums of oral cavity.

These oral disease and disorders are the most common health problems affecting the people of India and other parts of the World. Periodontitis has been Identified as a potential risk factor for cardiovascular disease.

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Periodontal disease is also associated with AIDS Patients. Some of conditions like necrotising ulcerative periodontitis and gingivitis. Most of pathogenic bacterial toxins and enzymes were involved in these oral and systemic infection [1-15].

Aim of the Study

- To isolate and identify the bacterial and fungal pathogens from prosthodontal, periodontal infection cases.
- To find out the incidence rate of cardiovascular disease is in prosthodontitis and periodontitis oral infection cases.

Materials and Methods

Specimens

We have collected oral specimen from 125 oral infection patients with prosthodontitis and periodontitis. outpatient attending Sri Ramakrishna Dental college and Hospitals. Oral swab, Gingival crevicular fluid, gingival pus, and oral ulcer from prosthodontal cases. All the collected specimens were processed for the Identification of bacterial and fungal pathogens.

Methods

The collected specimens were inoculated on the following culture medium on Blood agar, trypticase soy agar supplemented with 5% rabbit blood or 5% sheep blood and trypticase soy agar supplemented with vancomycin and bacitracin., and Sabouraud's Dextrose agar is used for the Isolation of fungal pathogens. Inoculated culture plates were incubated at 37 degree celsius and 25 degree celsius. The Isolated pathogens were Identified by following standard procedures.

Antibiotic sensitivity test were performed for the isolated bacterial and fungal pathogens

Sixty subgingival plaque samples from Periodontitis sites were plated on trypticase soy agar supplemented with 5% rabbit blood or 5% sheep blood and trypticase soy agar supplemented with vancomycin and bacitracin.

Fifty periodontal pathogens were isolated and tested for antibiotic sensitivity. *Staphylococcus aureus* 30% *Porphyromonas gingivalis* 15%, *Streptococcus faecalis* 10%, *Candida albicans* 5% The antibiotics tested were Clindamycin, metronidazole, tetracycline, Ciprofloxacin, Amoxycillin and ampicillin at concentrations above and below the achieved blood or gingival crevicular fluid levels. As a standard reference the minimal inhibitory concentrations (MICs) were determined using the agar dilution method. MICs were compared with ICs determined using the E-test method. The results showed an agreement ranging from 67% to 100%; sensitivity ranging from 75% to 100%; predictability ranging from 56% to 100% and specificity ranging from 33% to 96%. The E-test ICs for ampicillin, amoxycillin.

The herbal neem stick extract is also used in different concentration to observe the sensitivity pattern for the isolated pathogens. *Candida albicans* were tested on sabourauds dextrose agar with different concentration of chlorhexidine solution.

Results and Discussion

The total of 125 patient, 45 cases were associated with periodontitis, 55 cases were associated with prosthodontitis and 25 cases were having diabetes with denture.

Out of 45 periodontitis cases 25 were isolated *Staphylococcus aureus*, 10 cases showed the presence of *Porphyromonas gingivalis* and 10 patients were isolated *Streptococcus faecalis*.

Out of 55 cases of Prosthodontitis 23 cases showed the isolation of *Streptococcus pyogenes*, 27 cases were isolated *Staphylococcus aureus*, 5 cases were isolated *Candida albicans*.

25 patients were associated with diabetes mellitus having denture, all these patients were isolated predominantly with *Candida albicans*.

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This study Reveals that the most of Prosthodontal and periodontal infection patients were predominantly associated with the following pathogens such as *Staphylococcus aureus, Streptococcus pyogenes, Porphyromonas gingivalis, Streptococcus faecalis* and *Candida albicans.*

All the isolated bacterial pathogens were showed the sensitivity to Amoxycillin, ciprofloxacin, Metronidazole and 2% Neem stick extract solution.

Candida albicans were sensitive to 1% chlorhexidine solution.

Total 125 dental patients were analysed among that 63 patients were associated with Cardiovascular diseases.

Conclusion

1. The Predominant pathogen is Isolated from periodontitis, prosthodontitis patients are *Staphylococcus aureus, Streptococcus pyogenes*, and *Porphyromonas gingivalis*.

2. Most of Denture patients were isolated with 85% of *Candida albicans.*

3. All the isolated bacterial pathogens were showed the highly sensitivity to amoxycillin, ciprofloxacin, metronidazole and 2% neem stick extract solution.

4. *Candida albicans* showed sensitivity to 1% chlorhexidine solution on Sabourauds dextrose agar

5. Total 125 dental patients were analysed for cardiovascular disease among that 63 patients were associated with Cardiovascular diseases.

Bibliography

1. André RF., *et al.* "Prevalence of mutans streptococci isolated from complete dentures and their susceptibility to mouthrinses". *Brazilian Dental Journal* 22.1 (2011): 62-67.

2. Baena-Monroy T., *et al.* "Candida albicans, Staphylococcus aureus and Streptococcus mutans colonization in patients wearing dental prosthesis". *Medicina Oral Patologia Oral y Cirugia Bucal* 10.1 (2005): E27E-39.

3. Banting DW and Hill SA. "Microwave disinfection of dentures for the treatment of oral candidiasis". *Special Care in Dentistry* 21.1 (2001): 4-8.

4. Cavalcanti YW., *et al.* "Virulence and pathogenicity of Candida albicans is enhanced in biofilms containing oral bacteria". *Biofouling* 31.1 (2015): 27-38.

5. Coulthwaite L and Verran J. "Potential pathogenic aspects of denture plaque". *British Journal of Biomedical Science* 64.4 (2007): 180-189.

6. D'Aiuto., *et al.* "Periodontitis and systemic inflammation: control of the local infection is associated with a reduction in serum inflammatory markers". *Journal of Dental Research* 83.2 (2004): 156-160.

7. Nibali Luigi D'Aiuto., *et al.* "Severe periodontitis is associated with systemic inflammation and a dysmetabolic status: a case-control study". *Journal of Clinical Periodontology* 34.11 (2007): 931-937.

8. Paraskevas Spiros Huizinga., *et al.* "A systematic review and meta-analyses on C-reactive protein in relation to periodontitis". *Journal of Clinical Periodontology* 35.4 (2008): 277-290.

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9. D'Aiuto Francesco Ready., *et al*. "Periodontal disease and C-reactive protein-associated cardiovascular risk". *Journal of Periodontal Research* 39.4 (2004): 236-241.

10. Pussinen PJ., *et al*. "Systemic exposure to Porphyromonas gingivalis predicts incident stroke". *Atherosclerosis* 193.1 (2007): 222-228.

11. Pussinen PJ., *et al*. "Antibodies to periodontal pathogens and stroke risk". *Stroke* 35.9 (2004): 2020-2023.

12. Pussinen PJ., *et al*. "High serum antibody levels to Porphyromonas gingivalis predict myocardial infarction". *European Journal of Cardiovascular Prevention and Rehabilitation* 11.5 (2004): 408-411.

13. Ford PJ., *et al*. "Anti-P. gingivalis response correlates with atherosclerosis". *Journal of Dental Research* 86.1 (2007): 35-40.

14. Felton D., *et al*. "Evidence-based guidelines for the care and maintenance of complete dentures: a publication of the American College of prosthodontitis". *Journal of Prosthodontics* 20.1 (2011): S1-S12.

15. Hennessey TS. "Some antibacterial properties of chlorhexidine". *Journal of Periodontal Research* 12 (1973): 61-67.