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Evaluation of Aerobic Oral Microbial Flora Pattern in Necrotic Pulp with Chronic Periapical Abscess and Oral Mucosa

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A B S T R A C T

The most common type of dental abscess is a periapical abscess. It has been shown that endodontic infection comprises of a complex mixture of bacterial species. Fungi are oral commensal and causes wide variety of infections in human beings. The aim of this study was to identify species of the genus Candida and various aerobic bacterial species in clinically symptomatic patients having pulp necrosis with chronic endodontic periapical abscess, with radiographic images. The study included 75 patients of both sexes aged 19-75 years. Samples were taken from root canals with sterile # 25 paper points and from oral mucosa with a sterile swab. In chronic periapical abscess, various organisms grown were identified *Candida species* (37.33%), *Streptococcus viridans* (9.33%), Non hemolytic *Streptococcus* (5.3%),*S. pyogenes* (1.3%), Staphylococcus *aureus* (8%),Gram positive bacilli (8%) & *Coagulase negative Staphylococcus* (5.33%). Among *Candida*, seven different species were identified (*C. albicans* (24%), *C. tropicalis* (5.33%), *C. krusei* (2.66%), *C. glabrata* (1.33%), *C. guilliermondii* (1.3%), *C. parapsilopsis* (1.3%), and *C. pseudotropicalis* (1.33%). In oral mucosa Candida species (54.66%) was maximally isolated followed by *Streptococcus viridans* 14(22.66%). Considering all the samples isolated from oral mucosa, there was a significantly greater frequency of *C. albicans*, *S. viridans* than periapical zone of necrotic canals.

Introduction

Microorganisms from reservoirs in the oral cavity can spread and act as a source of infection. When the dentin-pulp complex is infected, microorganisms invade the pulp and root canal system as a result of necrosis. After entering the periapical tissues via the apical foramen, these bacteria are capable of inducing acute inflammation leading to pus formation and later to chronic stage (Siqueira, 2002). Aims and objectives of the study is to identify species of the genus candida and various aerobic bacterial species in oral mucosa and chronic periapical abscess.

Materials and Methods

Study design

The study was performed on both samples (oral mucosa and chronic periapical abscess) isolated from 75 immunocompetent adults of both sexes aged 19 to 75 years. This study was conducted from June to Aug. 2016 who visited the dental department of Mathura das mathur hospital, associated with Dr. S. N. Medical College, Jodhpur, Rajasthan. Their evaluation included dental/medical history, clinical/radiographic examination and pulp vitality tests. All permanent teeth were

selected and diagnosed with pulp necrosis, periapical lesion in chronic evolution. Each tooth had 2 ± 4 mm circumscribed or diffuse radiolucent, radiographically visible periapical lesion with draining fistula.

Exclusion criteria

1. Patients who were pregnant, had severe periodontal disease, systemic disease or had taken antibiotics, non-steroidal anti-inflammatory drugs and/or corticoids or anti-fungal medication.
2. Permanent teeth with immature apex, teeth with difficult access to foramen, endodontic re-treatments or teeth with restorations.

Inclusion criteria

1. Pulp necrosis with chronic endodontic periapical abscess
2. Draining sinus / fistula
3. Periapical radiolucency (I.O.P.A x-ray)
4. No tender to percussion or palpation
5. Poor oral hygiene at least one carious tooth

Sampling

Total 75 Patients of both sexes aged 19-75 years, rinsed their mouths with sterile distilled water, after which samples were taken from both sites:

1. Oral mucosa, by swabbing the dorsal and ventral part of the tongue after relative isolation of the area with cotton rolls and aspiration with high power suction. 2. Root canal, the tooth was completely isolated with a rubber dam and aspiration using high power suction. A 10% povidone iodine solution was applied to the operating field, an opening made with a round bur, and K-file #15 was used to perform the catheterization and confirm that the canal could be reached. A # 25 sterile paper point was inserted into the root canal and left for 1 minute. Then the paper point was suspended in a tube containing 5 microliters of normal saline, kept at 4°C, which was vortex and then processed.

Microbiological methods

All the samples were inoculated over Blood agar & MacConkey agar, incubated aerobically at 37˚C & Sabouraud's dextrose agar, at 25˚C-28˚C in B.O.D. incubator and examined after 24 to 48 hours for the appearance of any bacterial & fungal colonies up to species level according to the CLSI guideline standards (Clinical and Laboratory Standards Institute, 2014). For bacterial isolate, gram staining, catalase and coagulase test and for fungal isolate, Grams staining, 10% KOH for fungal hyphae or spores and Lactophenol cotton blue mount were done. Candida species were identified by germ tube test, characteristics morphology on Glucose agar-0.1%, culture characteristics on HI chrome agar (HI media, Mumbai, India).

Observations

In oral mucosa, out of 75 samples, 68 samples showed positive growth. In oral mucosa *Candida species* (54.66%) was maximally isolated followed by *Streptococcus viridans* (22.66%).

In chronic periapical abscess, out of 75 samples, 56 samples showed positive growth. *Candida species*, facultative anaerobe *Streptococcus viridians, Staphylococcus aureus, Gram positive bacilli* and *Coagulase negative Staphylococcus, Non hemolytic Streptococcus, S. pyogenes* were observed (37.33%, 09.33%, 8%, 8%, 5.33%, 5.33% & 1.33% respectively).

From chronic periapical abscess 7 Candida species were identified (*C. albicans* (24%), *C. tropicalis* (5.33%), *C. krusei* (2.66%), *C. glabrata* (1.33%), *C. guilliermondii* (1.33%),

C. parapsilopsis (1.33%), and *C. pseudotropicalis* (1.33%). From oral mucosa also 7 Candida species were identified (*C. albicans* (41.33%), *C. tropicalis* (5.33%), *C. krusei* (2.66%), *C. guilliermondii* (1.33%), *C. glabrata* (1.33%), *C. parapsilopsis* (1.33%), and *C. pseudotropicalis* (1.33%).

Results and Discussion

In the study total Candida species were 54.66% & among Candida sp., *C. albicans* (41.33%) was maximally isolated followed by *Streptococcus viridans* (22.66%) from oral mucosa which is almost similar to Natalia Nastri et. al. study in that total Candida sp. were 62.19% & *C. albicans* (31.70%) was the most prevalent species from oral mucosa samples (Natalia *et al*., 2011), Swapan Majumdar *et al*., (2014) reported that *Streptococci* (38.3%), *Staphylococcus* (6.5%) species found from oral mucosa samples.

In chronic periapical abscess, total Candida sp. were 37.33% & *Candida albicans* was observed in 24%, *Streptococcus viridans* in 09.33%, *Staphylococcus aureus* in 8%, *Coagulase negative staphylococcus* in 5.33%, non hemolytic Streptococci in 5.33% & *Streptococcus pyogenes* in 1.33%, which is almost similar to Natalia Nastri *et al*., (2011) study in that total Candida sp. were 22% but *C. albicans* was 6.09% & the most prevalent species from chronic periapical abscess. According to Aditi *et al*., (2014) study *Streptococcus viridans* was present in 13.3%, non hemolytic Streptococci in 3.3% & *Streptococcus pyogenes* in 3.3% which is almost similar to our study but in contrast to our study, according to Aditi *et al*., (2014) study, *Staphylococcus aureus* has been frequently reported from periapical abscess (43.3%).

Table.1 Presence of microbial flora in oral mucosa and chronic periapical abscess

n = number of patients

Microbial sp.	Oral Mucosa (n=75)	Chronic Periapical Abscess (n=75)	P value
***Candida* sp.**	41(54.66%)	28(37.33%)	0.048
Streptococcus viridians	17(22.66%)	07(09.33%)	0.043
Non hemolytic streptococci	03(4%)	04 (5.33%)	1.0
Streptococcus pyogenes	01(1.33%)	01(1.33%)	1.5
Staphylococcus aureus	00	06(8.00%)	0.02
Gram positive bacilli	04(5.33%)	06(8.00%)	0.7
Coagulase negative staphylococcus	00	04(5.33%)	0.12
***Nesseria* sp.**	02(2.66%)	00	0.4
Not detected	7(09.33%)	19(25.33%)	0.09

Table.2 Presence of Candida species in oral mucosa and chronic periapical abscess

Candida sp.	Oral Mucosa (n=75)	Chronic Periapical Abscess (n=75)	P value
C. albicans	31 (41.33%)	18(24.0%)	0.03
C. tropicalis	04(5.33%)	04(5.33%)	1.28
C. krusei	02(2.66%)	02(2.66%)	1.38
C. guilliermondii	01(1.33%)	01(1.33%)	1.5
C. parapsilopsis	01(1.33%)	01(1.33%)	1.5
C. glabrata	01(1.33%)	01(1.33%)	1.5
C. pseudotropicalis	01(1.33%)	01(1.33%)	1.5

Fig.1:(a) Periapical abscess (b) Periapical radiolucency (c) Draining fistula at the periapical region

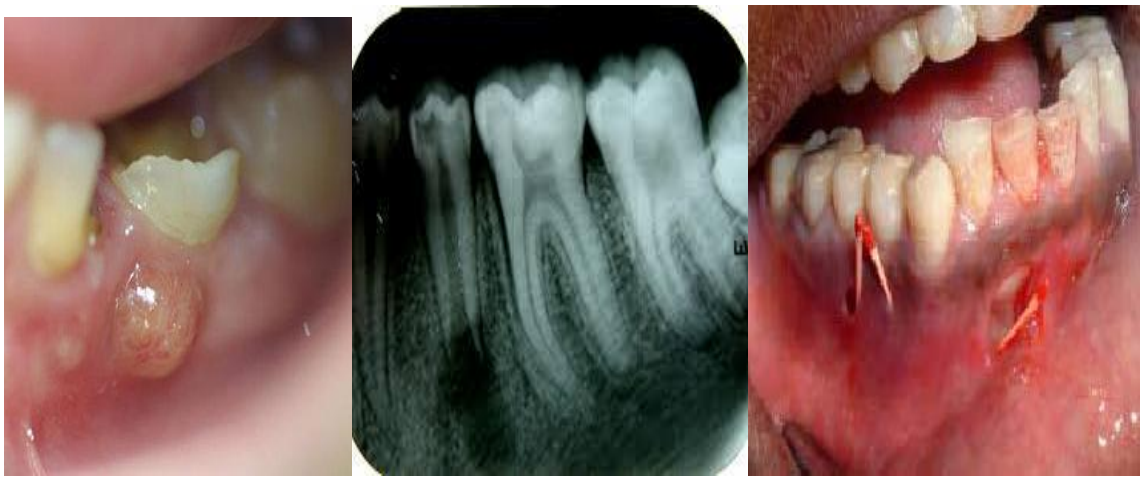
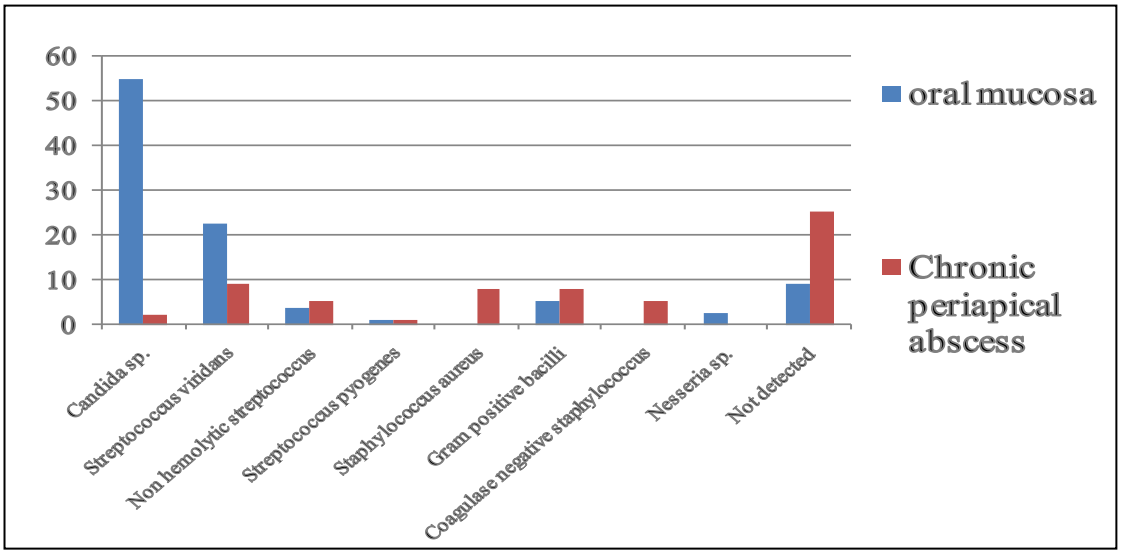


Fig.2 Presence of microbial flora in oral mucosa and chronic periapical abscess



In conclusion within the limits of the present study, it can be concluded that pyogenic abscesses of dental origin has isolates of mixed in nature. The species that was most frequently isolated from oral mucosa and chronic periapical abscess was Candida *albicans* followed by facultative anaerobic *Streptococcus viridans* which was statistically significant (P <0.05) due to poor oral hygiene, local & systemic predisposing factors and draining fistula, so altered the number and proportion of flora. Chronic periapical abscess and its complication affect the health care system, hence early diagnosis and appropriate intervention are extremely important. The prognosis of abscess is generally good if treated properly, but if left untreated, the infection my spread into surrounding bones, sinuses, cellulitis and further life threatening sepsis would aid long treatment as root canal, surgical care, antibiotic therapy and timely review. Very few studies were found particular in related to our study.

Limitations

Within limits in present study anaerobic microorganisms did not isolated.

References

Aditi Mahalle, *et al.* 2014. Evaluating the antibiotic susceptibility of bacteria isolated from the pyogenic abscess of dental origin, *J. Dent. Res. Scientific Develop.,* Vol 1, Issue 1.

Clinical and Laboratory Standards Institute. 2014. Performance Standards for Antimicrobial Susceptibility Testing: Twentieth Informational Supplement M 100 S 20-U. Wayne, PA, CLSI.

Natalia Nastri *et al.* 2011. Prevalence of candida species in necrotic pulp with chronic periapical processes, ISSN 0326-4815, Vol. 24 No 2, 183-187.

Siqueira, J.F. 2002. Endodontic infections: concepts, paradigms, and perspectives. *Oral Surg. Oral Med. Oral Pathol. Oral Radiol. Endod.,* 94: 281-293.

Swapan Majumdar, *et al.* 2014. Normal Microbial Flora of Oral Cavity, *J. Adv. Med. Dent. Sci. Res.,* 2(4): 62-66.

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