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BACTERIOLOGY OF PERIAPICAL INFECTIONS SEEN IN A TERTIARY HEALTH FACILITY-FINAL REPORT

[*]**Odai ED**[1] BDS, MSc (Pharmacology & Toxicology), FMCDS (Maxillofacial Surgery).

Isitua CC[2]**,** Ph. D (Microbiology).

Obuekwe ON[3] BDS, FWACS (Maxillofacial Surgery), FIDS.

1. Consultant Maxillofacial Surgeon, University of Benin Teaching Hospital, Benin-city.
2. Microbiologist, Microbiology Unit, Department of Biological Sciences, Afe Babalola University, Ado-Ekiti, Ekiti State.
3. Professor and Consultant Maxillofacial Surgeon, UNIBEN/UBTH Benin-city.

[*]Correspondence**:** danielson.odai@uniben.edu

BACKGROUND: Periapical infections present as highly symptomatic inflammatory reactions in the periapical tissues due to the presence of bacteria introduced through the root canal system and this may result in severe life-threatening infections. These lesions are usually polymicrobial and remain a public health concern more so as the resultant pain causes unnecessary suffering, sleep disturbances and diminished productiveness and quality of life. Usual symptoms are pain, redness, swelling, heat and loss of function and these are precipitated as a response to bacterial presence and their products. Pain resulting from periapical lesions has remained the commonest reason of visit to the dentist. The periapical lesions are frequently underestimated in terms of morbidity and mortality. The risk of potential serious consequences arising from the spread from

periapical lesion is still relevant today with many hospital admissions for dental sepsis. Treatment of these periapical lesions consists of removal of the source of infection by extirpation of the pulp, extracting the offending tooth with or without incision and drainage as well as systemic antibiotics as an adjunct. A rational use of antibiotics implies that those with proven efficacy against common pathogen are employed in appropriate doses.

AIM: This study aimed to identify the common bacteria involved in the periapical infections in our environment and to assess their susceptibility patterns to commonly used antibiotics, in the oral and maxillofacial out-patient clinic of the School of Dentistry, College of Medical Sciences, University of Benin, Benin-City, Nigeria.

METHODS: All consecutive and consenting patients scheduled to have their teeth extracted by intra-alveolar protocol for reason of periapical infections and who claimed not to have taken antibiotics in the preceding one week were recruited into the study population. Patients were anesthetized with 1.8mls of 2% lignocaine hydrochloride and involved tooth extracted by intra-alveolar procedure.

Immediately following extraction, samples were collected with a sterile swab stick and taken to the laboratory for culture using various agar plates, including:

i) Nutrient agar (Agar 15.0 gml^{-1}, peptone 5.0 gml^{-1}, sodium chloride 3.0 gml^{-1}, yeast extract 3.0 gml^{-1}, distilled water 1.0 liter, pH 7.4); 28 grams of this agar was prepared according to the manufacturer's protocol. The mix was stirred and autoclaved at 121^0C, for 15 minutes, and cooled to about 50^0C. About 20 mls was pour per petri dish and allowed to solidify.

ii) Blood agar (Prepared by addition of whole blood to cool molten nutrient agar at 50^0C. Portions are allowed to solidify in petri dishes.

iii) Chocolate agar plate (Nutrient agar and lysed red blood cells).

iv) MacConkey agar (Peptone 2.0 gml^{-1}, sodium chloride 5.0 gml^{-1}, sodium tuarocholate 5.0 gml^{-1}, agar 20.0 gml^{-1}, distilled water 1.0 liter, pH adjusted to 8 with 40% NaOH. This agar was prepared from commercially available dehydrated powder).

To culture, the various agar plates were streaked with in a clockwise manner with the swab stick. Candle jar method at 37^0C generating 5-10% carbon dioxide was used to create partial anaerobic conditions. Plates with no growth were re-inoculated at 24 hours and all plates were recovered for analysis at 48 hours. Colonial morphology and biochemical reactions were used to identify isolates including Gram staining, catalase, coagulase tube and slide tests as well as indole, citrate and urease tests.

Organisms thus identified were subjected to various antibiotic susceptibility tests, of the commonly prescribed and used antibiotics (cefuroxime, erythromycin, gentamycin, ofloxacin, levofloxacin, amoxicillin and clavulanate and obatrin) the dental center, using the disc diffusion method of Bauer and Kirby. This study protocol was approved by the Ethics committee of the University of Benin Teaching Hospital, Benin-City (Protocol No: ADM E 22/A/Vol. VII/835).

RESULTS: A total of eight hundred and ninety-eight swabs were taken for culture, identification and sensitivity test from 530 females and 368 males aged 16-80years, presenting with periapical lesions. Of all the swabs taken, 135(15%) yielded no growths, 610(68%) yielded single organisms and 153(17%) yielded more than one organisms. Isolated bacterial organisms were *Staphylococcus albus* (22.4% of isolates), *Staphylococcus aureus* (50.0% of isolates), *Streptococcus* mutans (14.4% of isolates), *Streptococcus viridans* (13.0% of isolates) *and Klebsiella spp* (20.0% of isolates). The susceptibility rate of the tested antibiotics were

amoxicillin and clavulanate 75%, cefuroxime 75%, obatrin 68%, ofloxacin 68%, erythromycin 62%, levofloxacin 59% and gentamycin 45%.

CONCLUSION: This study conclude that 15% of patients presenting with periapical infections have the picture masked by antibiotic abuse or misuse. Most organisms are susceptible to amoxicillin + clavulanate and cefuroxime. Most are resistance to gentamycin.

CONTRIBUTION TO KNOWLEDGE: This study has isolated the commonest organism in periapical infection in our center and revealed their susceptibility patterns to commonly used antibiotics. Making the choice of amoxicillin + clavulanate a prudent one for empirical therapy, before availability of microscopy, culture and susceptibility results.

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