ORIGINAL RESEARCH PAPER

Dental Science

AEROBIC BACTERIOLOGICAL STUDY AND CULTURE SENSITIVITY PATTERN OF ORAL AND MAXILLOFACIAL INFECTION

KEY WORDS:

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Among the most commonly encountered problems in the oral and maxillofacial surgical practice are Bacterial infections. This problem persists in spite of the availability of broad spectrum of potentially useful antibiotics against both aerobic and anaerobic micro-organisms Orofacial infections are common conditions that originate in the oral cavity and the face with the propensity to spread to adjacent tissues. While largely odontogenic in origin, the infections could arise from other structures of the face and oral cavity.[1] The widespread use of antibiotics in clinical medicine has contributed to a significant decline in the morbidity and mortality attributable to orofacial infection.[2] However, there are indications of global variations in the microbiology, sensitivity to antibiotics and clinical outcomes, which have not been studied locally.

The present study was aimed to examine the bacteriology of different types of orofacial infections for providing information on the prevalence of bacteria, and also the antibiotic sensitivity patterns of these organisms in order to provide a guide to clinicians for making rational decisions while determining the antibiotic of choice in the management of these infections.

MATERIAL AND METHODS

A prospective study of 117 patients with various forms of maxillofacial infections. (72 were space infections and 45 were surgical site infection) was conducted in the Dept of Oral Pathology , Indira Gandhi Govt Dental College Jammu .

Exclusion Criteria included those patients who required intensive medical care (e.g., cases with rheumatoid arthritis, respiratory tract infections, leukaemia) were, already given antibiotics before reporting to our institute. Specimen for bacteriological investigation were obtained aseptically through intact mucosa or skin. Abscesses were either aspirated with sterile syringes or swabbed during incision and drainage and culture and sensitivity was performed.

RESULT

Table: 1

TOTAL PT. 117	GENDER	TYPE OF INFECTIONS
	MALE 69 (58.97%)	SPACE INFECTION 30
		SURGICAL SITE INFECTION 39
	FEMALE 48 (41.03%)	SPACE INFECTION 42
		SURGICAL SITE INFECTION 06

TABLE-2: Age Distribution of Patients with facial space infections (n=72)

Age group	Space involved	%	No of pts
21-30	Submandibular Buccal	8 9 23.61	17
31-40	Submandibular buccal sublingual multiple spaces involved	9 6 3 3 29.17	21
41-50	Submandibular Buccal Sublingual multiple spaces involved	6 3 1 3 18.05	13
51-60	Submandibular buccal multiple spaces involved	6 5 1 16.67	12
61-70	Submandibular buccal multiple spaces involved	3 5 1 12.5	9
	TOTAL	100	72

TABLE-3: Distribution of Different Aerobic organism from total isolates.. (n=117)

BACTERIA	NUMBER	%
E. coli	28	23.93
CONS	24	20.51
Staphylococcus aureus	18	15.38
enterococcus	10	8.56
Klebsiella	10	8.56
pseudomonas	09	7.69
Proteus	08	6.83
providentia	07	5.98
Budding yeast like cells	03	2.56
	TOTAL-117	TOTAL-100

TABLE-4: Distribution of isolated bacteria with sensitivity pattern Antibiotics Beta- Lactam Cephalosporins Aminogly cosides quiniolones Macrolides Carbapenems

Bacteria S	R	S	R	S	R	S	R	S	R	S	R	S
E.coli n=28	0	28	6	22	22	6	5	23	5	18	28	0
CONS n=24	0	24	24	0	24	0	19	5	16	6	25	0
Staphylococcus aureus n=18	18	0	18*	0	14	4	12	6	10	7	6	12
Pseudomonas n=9	0	9	1	8	1	8	0	9	0	9	2	7
Proteus n=8	0	8	3	3	8	0	8	0	X		6	2

Enterococcus n=10	0	10	10	0	10	0	10	0	10	0	X									
Klebsiella n=10	0	10	2	8	7	3	4	5	3	7	10	0								
Providentia n=7	7	0	X		5	2	7	0	X		X									

DISCUSSION

In the present study the most common isolated bacteria were Escherichia coli (23.93%) followed by CONS (20.51%) and Staphylococcus aureus (15.38%). The relevant literature records that the facial spaces most commonly affected by orofacial infection include the submandibular, lateral pharyngeal, buccal, and submental spaces, in descending order of involvement for both multi- space and single space infections.[3] In terms of single space involvement most studies concur that the submandibular space is the most commonly involved site, followed by buccal and canine spaces.[4] The predominance of submandibular space infections is attributed to the presence of carious mandibular molars. Bacteria isolated in the current study consisted of aerobic organisms. Low counts of anaerobic organisms could be attributed to the acute nature of infections managed in this clinic, and a history of no previous antibiotic use in 71.9% of the patients. Mixed infections mature over time, resulting in an overgrowth of anaerobes in the later stages of the infection.[5]

Rao et al. reported K. pneumoniae was the second most common organism in diabetic patients, suffering from maxillofacial space infection present in 12.9% patient.[6] In Indian population, most patient suffering from maxillofacial space infection of odontogenic origin are of low socioeconomic group with poor oral hygiene, undernourished, and malnourished having low average autoimmune resistance status with compromised host defense mechanism. Therefore, Klebsiella came to be third most common organism.[7]

Har-El et al. reported Gram-negative aerobes such as Pseudomonas and E. coli were found in <6% cases.[8] The normal oral flora may be altered with tobacco use, pregnancy, diet, nutrition, age, oral hygiene, deciduous teeth eruption, dental caries, periodontal disease, antibiotics, hospitalization, and by genetic or racial factors. In these situations, commensal flora may become pathogenic and cause tissue inflammation and destruction.[9]

Maxillofacial infections are a public health concern, mainly related with the odontogenic origin if ignored or ill-treated at the early stage can rapidly develop and spread to neighbouring anatomic structures, leading serious complications like airway obstruction, mediastinitis, septicemia, cavernous sinus thrombosis, jugular vein thrombosis, carotid aneurysm and shock. So prevention and prompt management are necessary for countries like India where healthcare providers are inadequate in number and facilities are less. Incision and drainage are the prime treatment for sure, but the understanding of involved bacteriology and sensitivity pattern constitutes an important part of it.[10] Many times even after proper surgical treatment patient condition fails to improve, one of the important reasons for this is resistant bacterial strains and selection of wrong antibiotics.The semisynthetic drug like amoxicillin with clavulanic acid has been proved to be better than penicillin alone.

Our study found the same result i.e Cons, Proteus, Enterococcus and E.coli having high degree of sensitivity.

CONCLUSION

Infections that arise from teeth or their supporting structures are known as odontogenic infections and have been one of the most common diseases in the oral and maxillofacial region especially in developing countries.

The antibiotic susceptibility test results showed an increasing resistance towards penicillin groups of drug and quinolones group of drugs. Amoxiclav, Imipenem and cephalosporins were found to have excellent in-vitro activity against both Gram positive and Gram negative organisms. With odontogenic infections it is always advisable to begin with the empiric antibiotic regimen correlated to clinical presentation thinking of the most likely suspected microorganisms involved in the infections, which are usually the normal flora of the region, without forgetting the importance of early surgical intervention to reduce morbidity and complications.

It may provide inappropriate treatment and leads to the development of bacterial resistance . This clearly indicated that there was a change in resistant pattern of antibiotics specially for commonly prescribed antibiotics like -lactam (penicillin). So, proper antibiotics should be recommended and there is need to do surveillance of antibiotic-resistant organisms which will give us the idea and pattern of microbial resistance.

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