# Antibiotics Sensitivity Test as an important investigation measure in the Management of Odontogenic Abscesses: Clinical Study.

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#### Abstract:

The purpose of this study was to know the prevalence of microorganisms in odontogenic infections and the antibiotics sensitivity test for these isolated microorganisms in patients in Al-Door city by studying (19)females and (6)males .It showed that *Viridans Streptococci, Aeromonas,* commensal *Neisseria sp., Haemophilus sp., Enterobacter ,Staphylococcus aureus, Streptococcus sp.* was isolated from patients suffer from odontogenic infections. Erythromycin, gentamycin, tetracycline, tobramycin, rifampicin are more effected for isolated bacteria .Health education programs to improve oral hygiene practice should be considered.

Keywords: odontogenic infections, microbiological diagnosis, dental abscess, antibiotics sensitivity test.

# Aims of study:

To identify the prevalence of microorganisms in odontogenic infections and the antibiotics sensitivity test for thus isolated microorganisms.

# **Introduction:**

A typical odontogenic infection is a dentoalveolar abscess that spreads deeply into the soft tissue rather than exiting superficially through the oral and cutaneous route, consequently involving the fascial space .Following the path of least resistance through connective tissue and along fascial planes, infection may diffuse quite distantly from its dental source, causing damage to the surrounding structures. Appreciation not only the anatomy of the face and neck necessary to predict the pathway of spread of these infections, but also knowledge of how to drain these space adequately<sup>(1)</sup>. Odontogenic infection are usually mild and easily treated and may only require the administration of an antibiotic. Conversely, odontogenic infection may be complex and require an incision and drainage, or they may be complicated and require that the patient be admitted to hospital .some infections that occur in oral cavity are preventable if the surgeon uses appropriate antibiotic prophylaxis<sup>(2)</sup>.One of the most difficult problems to manage in dentistry is an odontogenic infection. These infections may range from low-grade, well-localized infections that require only minimal treatment to severe ,life -threating facial space infections. Although the overwhelming majority of odontogenic infections are easily managed by minor surgical procedure and supportive medical therapy that includes antibiotics administration, the practitioner must constantly bear in mind that these infections occasionally become severe in a very short time<sup>(2)</sup>.In the oral cavity and its surrounding structures, the predominant organisms such as the Staphylococci and Streptococci release enzymes responsible for the breakdown of fibrin(connective tissue ground substances) and lyse cellular debris, which facilitates a rapid spread of infection<sup>(1)</sup>. Since the mouth serves an important portal of entry into the body, it also provides access to a wide variety of both aerobic and anaerobic microbes. Saliva may contain up to 109\*10<sup>9</sup> bacteria per milliliter<sup>(3)</sup>. There are about 21 genera of bacteria including about 60 species in the oral cavity <sup>(4)</sup>. There are about 200 species can be isolated only from dental plaque<sup>(5)</sup>.Different types of bacteria can be isolated from oral cavity include Streptococci, Staphylococc, Corynebacteria, E.coli, Neisseria,

Lactobaccilli, Veillonella and colliforms <sup>(4)</sup>. Streptococcus mutans is an important factor enable production of enzyme leucosyltransferase to colonize them on the surface of toot hand its effect on other bacteria cause tooth decay and cavities<sup>(4,6)</sup>. At the first years of age aerobic, facultative anaerobic bacteria observed clearly like Actinomyces. Fusibacterium. Leptothrix. Spirochetes. and two species of Streptococci i.e. Streptococcus mutans and Streptococcus sangius. When the person becomes edentulous Lactobacilli. **Bacteroides** melaninogenicus will disappear (7,8,9). There are a series principles of therapy of odontogenic infections which includes :determine severity of infection, evaluate state of patients host defense mechanisms, determine whether patient should be treated by general dentist or specialist, treat infection surgically, support patient medically choose and prescribe appropriate antibiotic, administer antibiotic properly, and evaluate patient frequently<sup>(2)</sup>. The treatment of odontogenic infections is based on two fundamental elements: mechanical-surgical management and antibiotherapy<sup>(10)</sup>.In some cases, antibiotic prescription is empirical and based on the clinical condition of the patients<sup>(11)</sup>.

#### Materials and Methods:

#### A)Sampling:

This study was conducted in Tikrit during the period between Jun 2007-January 2008 .25 patients complain from odontogenic abscesses in special dental clinic have been examined and treated surgically by abscess drainage .The age of patients ranged from 18-50 years old. Patients were in both sex. In the same time swabs taken from the bloody area by using swab .

## **B)Culture:**

After that each swab was cultured directly on blood agar plates and macCongey agar plates and incubated at 37C<sup>o</sup> for 24 hours<sup>(12)</sup>.

#### C)Identification and diagnosis of bacteria:

All isolates were identify by using gram stain and biochemical test(conventional methods).

# D)Antibiotic sensitivity testing:

Which occur by a loop full from all isolates was inoculated into BHI broth directly and incubated at 37C<sup>o</sup> for 18 hours. The bacterial suspension poured on the surface of the blood agar plates, and left for 10 minutes to settle the bacteria. The excess of the bacterial suspension were discarded using Pasteur pipette. The plates were left for one hour at room temperature to dry <sup>(12)</sup>. The antibiotic discs were placed by sterile forceps cleaned with alcohol. The diameter of inhibition zone were measured.

# **Results:**

The present study showed that 19 of Twenty Five patients studied were females as showed in table(1). There are different type of bacteria isolated from patients which includes *Viridans streptococci, Aeromonas,* commensal *Neisseria, Haemophilus, Enterobacter, Staphylococcus aureus, Streptococcus sp., Streptococcus pneumonia* (Table 2). The various antibiotics used in this study. Antibiotic sensitivity of isolated bacteria showed in table 3.

#### Table (1) :Sex distribution among patients.

Sex	No. of Patients	%
Females	19	76%
Males	6	24%
Total	25	100%

Table(2):Types of isolated bacteria from patients.

Type of bacteria	No. of Isolated	Aerobic,anaerobic, facultative anaerobic					
	bacteria						
Viridans	17	facultative anaerobic					
streptococci							
Streptococcus sp.	7	facultative anaerobic					
Enterobacteria	6	Aerobic and anaerobic					
Aeromonas	5	Aerobic					
Staphylococcus	1	Aerobic					
aureus							
Commensal	1	Aerobic					
Neisseria							
Haemophilus	1	Aerobic					
Staphylococcus	2	Aerobic					
spp.							
Streptococcus	1	Aerobic					
pneumonia							

Table(3):Antibiotic sensitivity testing for isolated bacteria by using disc diffusion methods according
to number of isolates.

Types of isolated bacteria	Sensitivity%													
		Types of Antibiotics												
	Α	В	С	D	Е	F	G	Н	Ι	J	K	L	М	N
Viridans streptococci	53.8	80	54.5	81.8	86.6	61.5	9.09	16.6	91.6	0	25	57	80	75
Streptococcus sp.	0	-	-	100	100	-	0	0	-	-	100	-	-	-
Enterobacteria	100	50	0	25	100	40	0	16.6	100	-	0	100	80	100
Aeromonas	-	-	-	100	-	-	0	0	100	0	10	0	100	-
Staphylococcus aureus	100	100	100	0	100	100	0	0	0	-	-	-	-	-
Commensal Neisseria	100	100	100	100	-	-	0	100	0	-	-	-	-	100
Haemophilus	0	-	-	-	100	-	0	-	-	100	100	0	-	0
Staphylococcus spp.	40	100	50	100	60	100	0	20	100	0	0	66.6	-	-

A : Erythromycin	G: streptomycin				
B : Gentamycin	H: clindamycin				
C : Rifambicin	I: tobramycin				
D: tetracycline	J: Ampicillin				
E : chloramphenicol	K : Amoxycillin				
F : doxycyclin	L : cefotaxim				

#### **Discussion:**

The microbiological environment of an odontogenic infection is complex.It was now well established that typical odontogenic infection is a mixed aerobic and anaerobic infection<sup>(14)</sup>. The most commonly isolated aerobic species were streptococci .Staphylococcus aureus was not a common isolate. This study agreed with <sup>(15)</sup>, who found that the commonly found species were different strain of streptococci and one species of staphylococcus aureus. As regards antibiotic susceptibility, anner et a, in a study of dentoalveolar abscess reported facultative anaerobes to exhibit similar percentage of resistance to amoxicillin (7%).In our study ,for facultative anaerobic bacteria, the resistances were slightly lower this agreed with<sup>(16)</sup>.Other authors have reported high facultative anaerobe resistance to penicillin ,since the patients involved have severe condition and had been previously and infectively treated with antimicrobials on outpatient basis.Unlike<sup>(17)</sup> and <sup>(18)</sup>, who found low percentages of resistance to clindamycin in facultative anaerobes bacteria, we record high relatively high resistance in terms of absolute values(0%). <sup>(19)</sup>, reported the efficacy of penicillin in periodontal abscess to be similar in the treatment of odontogenic infections. Similar observations were published by <sup>(20)</sup>, who in their comparative study to penicillin ,amoxicillin, and clindamycin for the treatment of cellulites of periapical origin, found no significant differences among treatments. <sup>(21)</sup>, in their comparative study of penicillin ,amoxicillin ,and clindamycin for the treatment of periapical origin. <sup>(22)</sup>, found that *Staphylococcus aureus* and *viridans streptococci* sensitive to clindamycin (75.3% and 42.7%) respectively. The need to combine medical therapy with surgical drainage of purulent material was noted in the treatment in large infections, also in many cases medical therapy alone was enough <sup>(23)</sup>.

M : Bacitracin N : nalidixicacid

- : no use

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# أهمية اختبار المضادات الحيوية في السيطرة على الخراجات الناشئة عن التهابات الفم والأسنان:دراسة تطبيقية

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### الملخص

الغرض من هذه الدراسة هو للتعرف على الأحياء المجهرية في إصابات واختبار الحساسية للمضادات الحيوية لهذه الأحياء المجهرية المعزولة من المرضى في منطقة الدور بدراسة (١٩)ذكر و (٦)إناث لوحظ إن .Haemophilus sp. ,Haemophilus sp. Erythromycin, . Staphylococcus aureus, Streptococcus sp. ولنصح الفريا المعزولة .يجب إن يؤخذ بنظر الاعتبار الثقافة الصحية للفم التابعة لمنظمة الصحة العالمية.