



Original Article

Antibiotic Sensitivity Treatment for Gram Positive Bacteria Isolated from Pus Sample

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ABSTRACT

To screen various bacterial pathogens present in pus and to determine their antibiotic sensitivity and resistance pattern against the commonly used standard antibiotics. The common bacterial pathogens isolated from the pus samples were Gram positive cocci *Staphylococcus aureus*. The bacterial pathogen showed resistance to most of the antibiotics. The magic bullets, the miraculous drugs, antibiotics can be used to heal the wounds and thus the amputations, which is the threat of all patients in the whole world can be minimized to a great extent. Amoxicilline(Ac), Ampicillin/subbactam(As), Cephalexin(CX) Ofloxacin(OF), Gentamycin(G), Erythromycin(E), Tetracycline(T) antibiotic are show high resistance to prevention from gram positive bacteria. In these study MRSA resistance patient are not observed.

Key words: *Staphylococcus, Antibiotic, Sensitivity, Pathogen, Resistance.*

INTRODUCTION

In pus infection breaking of the host protective layer- the skin and thus disturbing the protective functions of the layer, will induce many cell types into the wound to initiate host response [1]. Infection of the wound is the successful invasion and proliferation by one or more species of microorganisms anywhere within the body's sterile tissues, sometimes resulting in pus formation. According to the nature of the infection is the attachment of microorganisms to host cells and they proliferate, colonize and become better placed to cause damage to the host tissues [1]. Wound can be infected by a variety of microorganisms ranging from bacteria to fungus and parasites [2]. The gram negative and gram-positive microorganisms. The common gram-positive organisms are the β -hemolytic streptococcus – *Streptococcus pyogenes* and *Staphylococcus aureus* [3]. To protect from microorganism today a best option is antibiotic therapy, now different generation antibiotic are present. The routine use of antibiotics in both medical and veterinary medicine has resulted in wide spread antibiotic resistance and development of antibiotic resistance genes especially within the gram negative organisms [4]. The aim of this study to find out number of gram positive bacteria in pus sample and its antibiotic resistance pattern.

MATERIAL AND METHOD

Sample Collection: The pus samples were collected from the outpatient departments of the Pt. J.L. Nehru memorial medical college and Dr. B.R.A.M. hospital, Raipur (C.G.). India. For epidemiological data analysis, we took into account every patient's clinical data (age, sex, site, hospitalization etc.) and the origin of the bacterial sample collection.

Isolation and Identification: The pus samples were examined for its odour, colour, presence of tissue and blood. The initial characterizations of the organisms present in the pus samples were carried out by direct microscopic examination using staining technique. Using selective plate technique did secondary analysis. The usages of selective media suppress the growth of the unwanted bacteria and perform biochemical tests for confirmation.

Preparation of Bacterial Strains Inoculums: The isolated bacterial strains; *Staphylococcus aureus*, inoculums were prepared in 5 ml nutrient broth with 3 to 5 colonies of each bacterial strain. The inoculums were incubated at 37°C for 24 hr to get sample approximately close to 0.5% Mc Farland standard for susceptibility testing [5].

Antibiotic Discs Used: Commercially available antibiotic discs such as amikacin(Ak) 30 g, amoxicilline(Ac) 30 g, ampicillin/subbactam(As) 10 g, azithromycin (Az) 15 g, ciprofloxacin(CF)

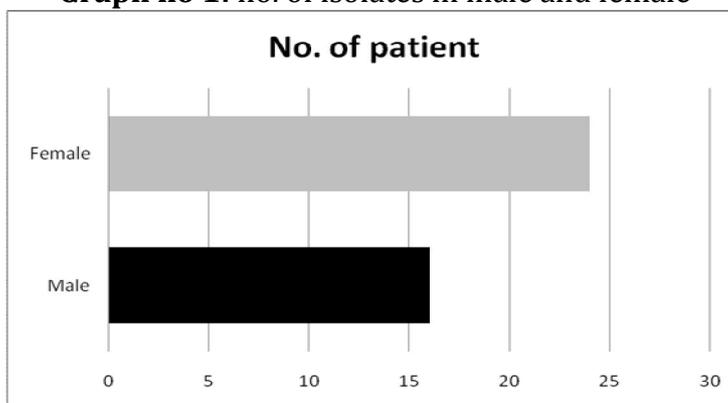
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10 g, clindamycin(CM) 2 g, cloxacillin(Cx) 5 g, cephalixin(CX) 30 g, chloramphenicol(C) 30 g, linezoild(Li) 30 g, gentamycin(G) 10 g, ofloxacin(OF) 5 g, gatifloxacin(GT) 5 g, moxifloxacin(Mf) 5 g, erythromycin(E) 15 g, tetracycline(T) 30 g were used [5]. A sterile cotton swab was dipped into the cell suspension of the respective isolate whose turbidity was checked with 0.5% McFarland's standard and inoculated on the entire agar surface of each plate first in a horizontal direction and then in a vertical direction to ensure even distribution of the organisms. Antibiotic discs are placed after 5 min. to allowed the agar surface to dry. The inoculated plates were incubated at 37°C for 24-48 hr in an inverted position and the zone of inhibition was recorded. The zone of inhibition was expressed in terms of the Mean \pm Standard Deviation by using four replicas and the results were tabulated.

RESULT AND DISCUSSION

The organisms associated with the infections were *Staphylococcus aureus* (45.1%) and Amikacin(Ak), Azithromycin (Az), Ciprofloxacin(CF), Clindamycin(CM), Cloxacillin(Cx), Chloramphenicol(C), Moxifloxacin(Mf), Linezoild(Li), Gatifloxacin(GT) are highly sensitive for treatment. These findings agree with those reported by Taylor (1992) on surgical site infections where the most common wound contaminant was *Staphylococcus aureus* (50.32%). The findings also agree with those of Buwembo [6] who identified *Staphylococcus aureus* as the commonest causative agent of potentially contaminated wounds in Mulago hospital. The high prevalence of *Staphylococcus aureus* infection may be because it is an endogenous source of infection. Nasal carriage of *S. aureus* is an important risk factor for infection of surgical site as the organism is a normal flora in the nostrils. Infection with this organism may also be due to contamination from the environment e.g. contamination of surgical instruments. With the disruption of natural skin barrier *S.aureus*, which is a common bacterium on surfaces, easily find their way into surgical sites [7]. There are 254 swab examined and swabs yields growth 116 (47.3%) isolates. This means that sample yielded more than one organism [3].

Graph no 1: no. of isolates in male and female



64.65% of Enterobacteriaceae group was observed and 52.65% wound swabs failed to yield any growth. This could be due to normal healing process where the bacteria have been overpowered by body's defense mechanism, antimicrobial activity in patients circulation since all of them had been on antibiotic therapy post operatively at time of collecting the samples or adequate nursing care e.g. use of antiseptics for cleaning the wounds. It is also possible that some organisms could have been anaerobic bacteria that were missed as cultures were incubated aerobically. This condition could not therefore support growth of such organisms. The control of *S. aureus* causing diseases heavily relies on intensive use of antibiotic drugs. The pre operative antibiotics that the patients received were gentamicin/crystalline penicillin, ampiclox, amoxycillin, ampicillin, metronidazole and others. The most probable reason for their choice being that these antibiotics have been on market for long, they are readily available and relatively cheap [8]. However, as a result of increasing use of antibiotics, the pathogenic bacteria become more easily resistant to a wide range of these drugs [9]. For instance, a year after the introduction of methicillin

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as an efficient antibiotic in 1960 [10], *S. aureus* has been reported to naturally resist this antibiotic [11]. Thus, MRSA have been reported in Europe, America and recently in Africa [12]. Later, MRSA cases have been reported in extra-hospital environments notably among the community with no contact to hospitals [13, 14].

Graph no 2: no. of patient in different isolates and different age group

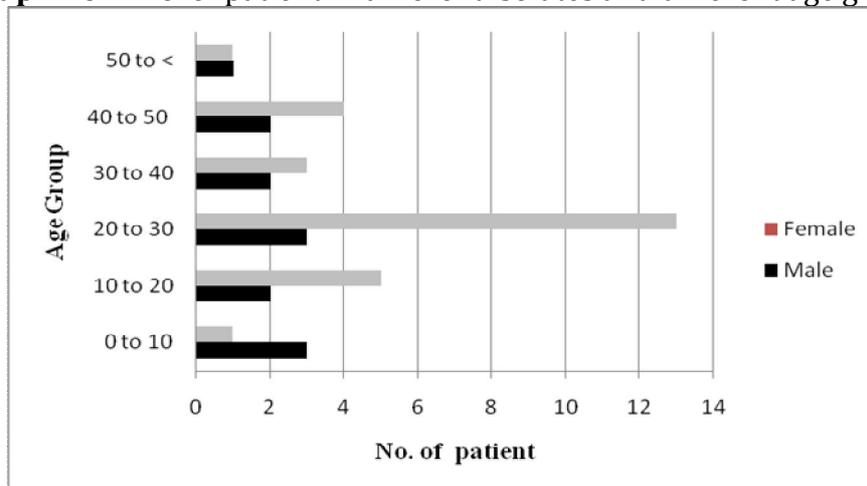


Table no. 1: List of zone size of antibiotic and sensitive antibiotic

S.No.	Name	Standard			S.A.O.	
		Zone in mm			R	IS
		R	IS	S	R	IS
1.	Amikacin(Ak)	14	15-16	17	21	1
2.	Amoxycilline(Ac)	19	-	20	35	0
3.	Ampi/subbactum(As)	11	12-14	15	37	0
4.	Azithromycin (Az)	13	14-17	18	18	2
5.	Ciprofloxacin(CF)	15	16-20	21	16	6
6.	Clindamycin(CM)	14	15-17	18	3	2
7.	Cloxacillin(Cx)	14	15-20	21	26	0
8.	Cephalexin(CX)	11	12-13	14	24	0
9.	Chloramphenicol(C)	14	15-17	18	32	1
10.	Ofloxacin(OF)	12	13-17	18	14	3
11.	Moxifloxacin(Mf)	12	13-15	16	34	0
12.	Linezoild(Li)	14	15-17	18	14	4
13.	Gentamycin(G)	18	-	21	15	0
14.	Gatifloxacin(GT)	12	13-14	15	39	0
15.	Erythromycin(E)	13	14-22	23	29	1
16.	Tetracycline(T)	14	15-18	19	32	1

R=Resistance, IS=Intermediated sensitive, S=Sensitive

Table no. 2: List of sensitive antibiotic in gram positive bacteria

S.N o.	Isolate	Sensitive Antibiotic															
		Ak	Ac	As	Az	CF	CM	CX	Cx	C	OF	Mf	Li	G	GT	E	T
1	S. sp.	17	4	3	20	17	13	8	15	19	5	22	25	1	37	10	6

S.= *Staphylococcus aureus*

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