ORIGINAL ARTICLE

Prevalence and Sensitivity of Stayphlococcus Aureus in Sialkot-Pakistan

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ABSTRACT

Background: The resistance against the pathogens is increasing day by day leading to long hospital stay and life threatening diseases. Staphylococcus Aureus causes suppurative lesions which affects majority of patients coming to hospitals.
Aim: To determine sensitivity of Staphylococcus Aureus and its prevalence among males and females in Sialkot-Pakistan.
Study Design: Cross-sectional Study
Place & duration of study: Department of Pathology, Allama-Iqbal Memorial Teaching Hospital Sialkot from January 2016 to January 2017.
Method: Cross-sectional study was conducted at AIMTH sialkot by separating data of 100 patients having Staphylococcus Aureus infection, was cultured on Maconkey's agar, confirmed by catalase and coagulase tests. Antibiotics sensitivity was carried using Kirby-Buer Disk.
Results: Prevalence was 60% among males and 40% among females. The sensitivity to antibiotics were Linezolid (100%), Teicoplanin (100%), Vancomycin (95%), Amikacin(81%), Fusicidic Acid(70%), Clindamycin (63%), Minocycline (65%), Doxycycline (59%), Gentamycin(57%), Augmentin(52%), Cefradine (46%), Moxifloxacin (44%), Septran (39%), Ciprofloxacin(29%), Cefoxitin(26%), Ofloxacin(23%), Levofloxacin(24%), Erthromycin(10%) and penicillin (03%).
Keywords: Staphylococcus aureus, Allama Iqbal Memorial Teaching hospital Sialkot

INTRODUCTION

Staphylococcus includes bacteria's, among them staphylococcus aureus is the most important pathogenic organism. Staphylococcus aureus makes colonies mostly in nasal cavity but can be found in skin, oral cavity and gastro-intestinal tract[1]. Staphylococcus aureus causes infections which are mainly hospital and community acquired[2]. The suppressed or immunocompromised state acts as activation factor for Staphylococcus aureus. The disease got worsen in its severity and duration due to increasing resistance pattern. The development of resistance in Staphylococcus aureus is very abrupt which either prolongs or fails the action of most of the antibiotics. Hospital acquired infections are mostly severe in nature and resistant to many of the antibiotics[3]. In the past few decades, those antibiotics which are thought to be sensitive to Staphylococcus aureus are now developing resistance. Vancomycin had very precise sensitivity in the past, now cases of their resistance are developing. Establishment and emergence of VRSA have been reported[4]. In the past two decades, the mortality rates of Staphylococcus

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aureus infections have been increased about 15-60%[5].

Now to reduce the increasing susceptibility of infections and progression of their resistance, control of such acquired infections can be reduced by surveillance of resistant strains and it will also prove to be cost effective.

In Pakistan the development of resistance against Staphylococcus aureus is increasing. The trend in the Sialkot-Pakistan remains unknown. The present study is designed to investigate the prevalence of Staphylococcus aureus in Sialkot population and its sensitivity against various groups of antibiotic so that patient can get better empirical therapy.

METHOD AND MATERIAL

This was cross-sectional study carried on sample of group of patients. The sample includes Pus, FNAC, Blood, Throat swab, Ear swab and Eye swab. The sampling was done at Allama Iqbal Memorial Teaching Hospital Sialkot. Sampling was collected from people of all age groups and was handled under strict aseptic measures. Sample were cultured. 100 cases were selected having staphylococcus aureus infection. Among 100 samples 88 were pus, 8 were blood, 01 was FNAC, 01 was throat swab, 01 was ear swab, 01 was eye swab.

Samples were inoculated on Maconkey's Agar medium prepared according to manufacturer's guidelines. Using Platinium wires, samples were spread on agar surface. The inoculated plates were kept for incubation for 24 hours at 37 degree aerobically. Staphylococcus aureus forms a fairly large yellow colony on rich medium. Staphylococcus aureus are facultative anaerobes that grows by aerobic respiration or by fermentation that principally yield lactic acid. Staphylococcus aureus cangrow at 15-45 degree and at NaCl concentration as high as 15%[1].

Samples which were inoculated on agar plates gave golden yellow colonies. The Staphylococcus aureus isolated colonies were confirmed by Gram staining, catalase and coagulase test.
Sensitivity test was done using Kirby-Bauer (1966) Disk Diffusion standard as practiced in A.I.M.T.H. Sialkot using following antibiotics.

Linezolid (30µg), Teicoplanin(30µg), Vancomycin (30µg), Amikacin (30µg), Fusicidic Acid (30µg), Clindamycin (2µg), Minocycline (30µg), Doxycycline (30µg), Gentamycin (10µg), Augmentin (10µg), Cefradine (30µg), Moxifloxacin (5µg), Septran(30µg), Ciprofloxacin (5µg), Cefoxitin(30µg), Ofloxacin (5µg), Levofloxacin (5µg), Erthromycin (15µg) and penicillin(10units). The procedure was done under quality control following international standards and protocols. The culture growth was done on agar plates having uniform depth. Meter ruler were used for this purpose and clearance zones around antibiotics disks were calculated.
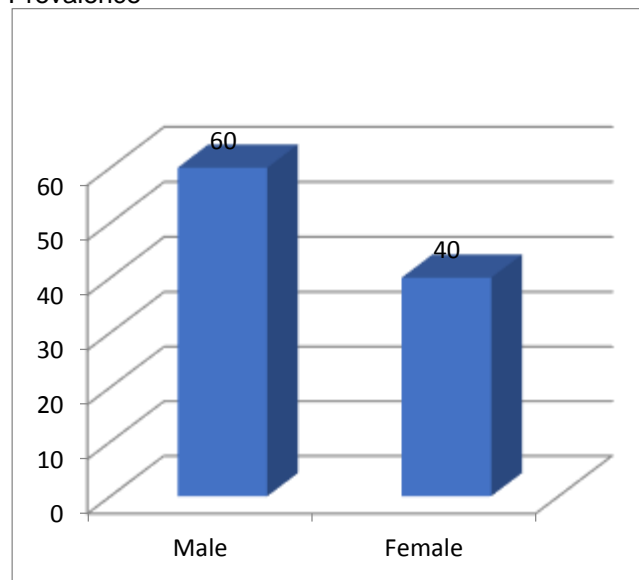
RESULTS

The sample of 100 patients were collected. During study, prevalence of Staphylococcus aureus in males is greater than in females. Among 100 samples, 60 were male and 40 were female.
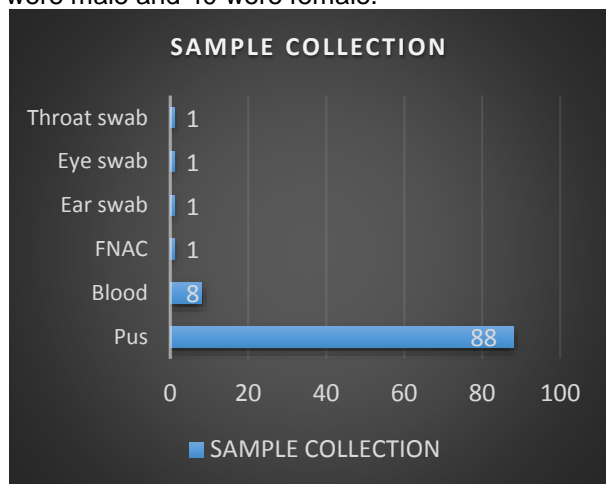
pus	88
blood	08
Throat swab	01
Ear swab	01
Eye swab	01
FNAC	01

Prevalence

Sensity of staphlococcus aureus to antibiotics

Antibiotic	Sensitive %	Resistant%
Linezolid	100	0
Teicoplanin	100	0
Vancomycin	94	6
Amikacin	81	19
Fusicidic acid	70	30
Clindamycin	63	27
Minocycline	65	35
Doxycycline	59	41
Gentamycin	57	43
Augmenten	52	48
Cefradine	46	54
Moxifloxacin	44	56
Septran	39	61
Ciprofloxacin	29	71
Cefoxitin	26	74
Ofloxacin	23	77
Levofloxacin	24	76
Erthromcin	10	90
Penicillin	3	97

DISCUSSION

The higher prevalence rates of Staphylococcus aureus in general population and among them higher rates in males. Males are more prone to Staphylococcus aureus infections[6]. There might be reason that in our population, especially in Sialkot,

majority of people works in industries so community acquired infections prevail.

The high prevalence and increased resistance is due to multiple factors like long duration of hospital stay leading to Hospital acquired infections[7]. The sterilization in the hospital wards, hygienic condition of patients and wards, clothes, pricking, sneezing and patient's personal habits, all are risk factors that increases the susceptibility. The transmission of Staphylococcus aureus among patients in the wards, from patients to staff nurses and doctors increases its prevalence. Secondly, the strains in the hospitals are already resistant one due to overuse of antibiotics, poor hygienic condition and immune-compromised states. MRSA is leading variant strain of Staphylococcus aureus causing high mortality and morbidity[8].

By comparing the results of the data collected, Penicillin has the highest resistance among the drugs tested. Macrolide and Floroquinolones also have high resistance against Staphylococcus aureus. Gentamycin and Augmentin showed almost 50% resistance. Results have also shown resistant cases against vancomycin. 5% VRSA cases have been reported.

But Linezolid and Teicoplanin are the two drugs that have shown 100% efficacy against Staphylococcus aureus with not even a single resistant case. So when all the antibiotics line are failed against VRSA and MRSA, Linezolid and Teicoplanin should be drug of choices in these cases.

CONCLUSION

Prevalence of Staphylococcus aureus was higher in males 60% as compared to females 40%. The resistance against Staphylococcus aureus is increasing day by day and only Linezolid and Teicoplanin have showed 100% sensitivity.

RECOMENDATIONS

We should take precautionary measures to decrease this risk of staph aureus infection by different methods like:

Proper sterilization during surgery
Use of antibiotics after culture and sensitivity
Less stay in hospital
No way to give antibiotics without prescription

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