

Pattern of Antimicrobial Susceptibility Staphylococcus Aureus Isolated from Idris Teaching Hospital Sialkot & Alama Iqbal Memorial Teaching Hospital Sialkot, Pakistan

Isolation of Staphylococcus Aureus from Idris Teaching Hospital Sialkot

Madiha Mumtaz¹, M Rafique⁴, Adul Sattar⁵, Saleh Mohammad² and Kamran Hamid³

ABSTRACT

Objective: To study the antimicrobial susceptibility pattern of Staphylococcus Aureus in a Alama Iqbal Memorial Hospital Sialkot & Idris Teaching Hospital Sialkot.

Study Design: Descriptive / cross sectional study

Place and Duration of Study: This study was conducted at the Microbiology, Alama Iqbal Memorial Hospital Sialkot & Idris Teaching Hospital Sialkot during Jan 2019 to Jan 2020.

Materials and Methods: Three hundred and forty three samples were included in the study among which two hundred and ninety four samples showed the growth of different microorganisms. Pus, blood, body fluids, and sputum and wound swabs specimen were added and different biochemical reactions were done in order to identify Staphylococcus aureus specimen. The bacterial susceptibility of these specimen were conducted by disk diffusion method using cefoxitin (thirty micro grams) and different antibacterial drugs are tested against methicillin repellent and reactive staphylococcus specimen as outlined by Clinical Laboratory Standard worldwide Guidelines. Informed written was taken from each sick person before taking the sample. The permission of Ethical Committee was taken before collection of data and publishing in the medical journal. The results were assessed by SPSS version 10.

Results: Sensitivity pattern of Con staphylococci was Penicilin 0% , doxycyline 49%, erythromycin 16% , gentamycin 45% , amikasin 63% , Ciproflaxicin 20%, amoxiclav 41%, methycilin 41%, amoxifloxain 31%, clindamycin 73%, fusidici acid 47%, vancomycin 100%, chorophenocal 98%, septan 31%, linsolate 100%, cephradine 41%, Sensitivity Pattern of methicilin sensitive staphylococcus aureus is penicilin 1%, augmentin 100%, minocyclane 67%, doxycycline 65%, erythromycin 65%, gentamycin 95%, amikasin 97%, ciprofloxaicin 41%, amoxifloaxacin 46%, clindamycin 89%, fusidic acid 78%, vancomycin 100%, chorophenocal 84%, linsolit 100%, cefradine 100%, septan 51%, Sensitivity Pattern of methicilin resistance staphylococci aureus was penicillin 0%, amoxiclave 0%, minocycline 51%, erythromycin 8%, gentamycin 65%, amikasin 83%, ciprofloxacilin 10%, amoxifloacin 18%, clindamycin 77%, fusidic acid 75%, vancomycin 100%, chorophenocal 100%, septran 38%, levofloxaicin 100%, cefradine 00%.

Conclusion: The antibiotic susceptibility pattern derived from the above work showed a lot of antimicrobial chances available for staphylococcus aureus, so the use of Vancomycin and linezolid should be the last centre for treating such infections. It also draws attention towards increasing repellent between the widely used antibiotic such as ciprofloxacilin so its overuse should be discouraged.

Key Words: Antimicrobial susceptibility, Methicillin resistant Staphylococcus aureus, Staphylococcus aureus

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INTRODUCTION

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Staphylococcus aureus is one of the most common and shared tiny living organism involved in human contagious a.¹ It causes a wide range of contagious a which includes skin and soft tissue contagious, lung inflammation, infective inflammation of heart leading to infection of blood.¹ It has been found as one of the most common organisms involved in after operation wound contagious.² Nose carriage among health care workers is the main source of nosocomial infections. The action by animal of establishing itself in an area rate of workers are some of the lowest paid people in the country.³ In currently there has been an causing people to feel risk increase in methicillin repellent Staphylococcus aureus (MRSA) in hospital.⁴ The

increase hospital admission for CAP (community obtain lung rawness), VAP (ventilator associated lung rawness) and surgical site communicable are linked with increased prevalence of MRSA.⁵ Before the finding of penicillin, staphylococcal blood poisoning caused by bacteria was a major risk.¹ Within a short period bacteria developed repellent to penicillin and therefore Building ineffective.^{2,6,7,8} In 1960s beta lactamase penicillin's appear as mutinying drugs, but soon they failed after the appearance of methicillin repellent Staphylococcus aureus (MRSA). Against MRSA vancomycin is the acceptable substance able to inhibit or kill microorganisms and the best medicine to be used.^{9,10} The present state is the appearance of vancomycin repellent strains of staphylococcus aureus, and thus the treatment choice are also present for such repellent strains.^{11,12} The grounds of our work is to search the antimicrobial susceptibility pattern of Staphylococcus aureus both methicillin repellent and delicate isolated in a Allama Iqbal Memorial Teaching Hospital Sialkot and Idris Teaching Hospital Sialkot limit the unnecessary usage of broad spectrum antibiotics.

MATERIALS AND METHODS

Three hundred and forty three samples were included in the study among which two hundred and ninety four samples showed the growth of different microorganisms. Pus, blood, body fluids, and sputum and wound swabs specimen were added and different

biochemical reactions were done in order to identify Staphylococcus aureus specimen. The bacterial susceptibility of these specimen were conducted by disk diffusion method using cefoxitin (thirty micro grams) and different antibacterial drugs are tested against methicillin repellent and reactive staphylococcus specimen as outlined by Clinical Laboratory Standard worldwide Guidelines. Informed written was taken from each sick person before taking the sample. The permission of Ethical Committee was taken before collection of data and publishing in the medical journal. The results were assessed by SPSS version 10.

RESULTS

Sensitivity pattern of Con stayplyococci was Pencilin 0%, doxycyaline 49%, erthromycin 16%, gentamycin 45%, amikasin 63%, Ciproflaixicin 20%, amoxiclav 41%, methycilin 41%, amoxifloxain 31 %, clindamycin 73%, fusidici acid 47%, vancomycin 100%, chorophenocal 98%, septan 31%, linsolate 100%, cephradine 41%, as shown in table 1.

Sensitivity Pattern of methicilin sensitive staphylococcus aureus is pencilin 1%, augmentin 100%, minocyclane 67%, doxycycline 65%, erythromycin 65%, gentamycin 95%, amikasin 97%, ciprofloxaicin 41%, amoxifloaxacin 46%, clindamycin 89%, fusidic acid 78%, vancomycin 100%, chorophenocal 84%, linsosit 100%, cefradine 100%, septan 51%, as shown in table 2.

Table No.1: Sensitivity Pattern of CoN Staphylococci N=49

Total Staphylococcus species	
	343
Staphylococcus aureus	
	294
MSSA-158	MRSA-136
CoN Staphylococci	
	49

Sensitivity Patteren of CoN Staphylococci N=49		
Antibiotic	Value	Percentage
Penicillin	0	0%
Doxycycline	24	49%
Erythromycin	8	16%
Gentamycin	22	45%
Amikacin	31	63%
Ciprofloxacin	10	20%
Amoxiclave	20	41%
Methicilin	20	41%
Moxifloxacin	15	31%
Clindamycin	36	73%
Fusidic acid	23	47%
Vancomycin	49	100%
Chloramphenicol	48	98%
Septran	15	31%
Linezolid	49	100%
Cefradine	20	41%

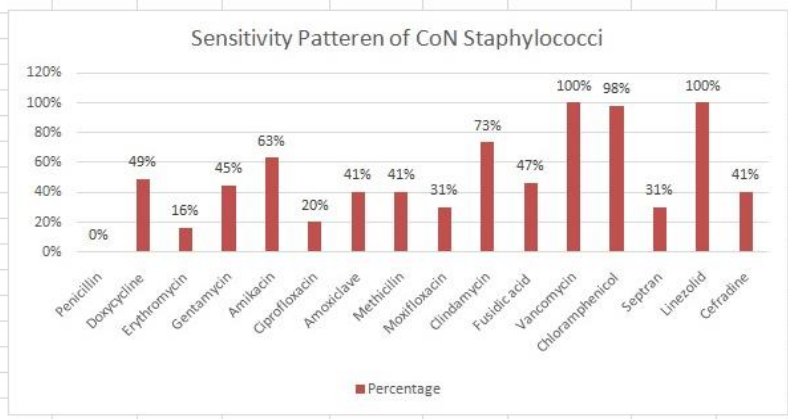


Table No. 2: Sensitivity Pattern of Methicillin sensitive Staphylococcus aureus N=158

Sensitivity Pattern of Methicillin sensitive Staphylococcus aureus N=158		
Antibiotic	Value	Percentage
Penicillin	1	1%
Augmentin	158	100%
Minocycline	106	67%
Doxycycline	102	65%
Erythromycin	89	56%
Gentamycin	142	90%
Amikacin	154	97%
Ciprofloxacin	65	41%
Moxifloxacin	73	46%
Clindamycin	140	89%
Fusidic acid	123	78%
Vancomycin	158	100%
Chloramphenicol	132	84%
Linezolid	158	100%
Cefradine	158	100%
Sepran	80	51%

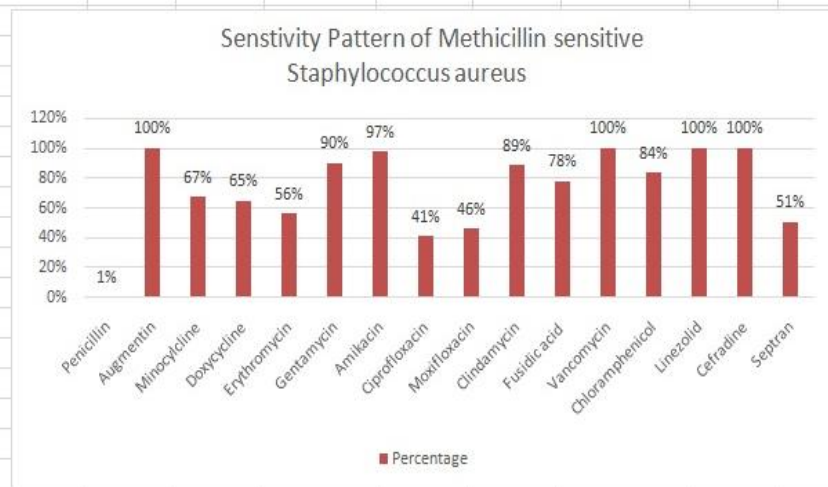
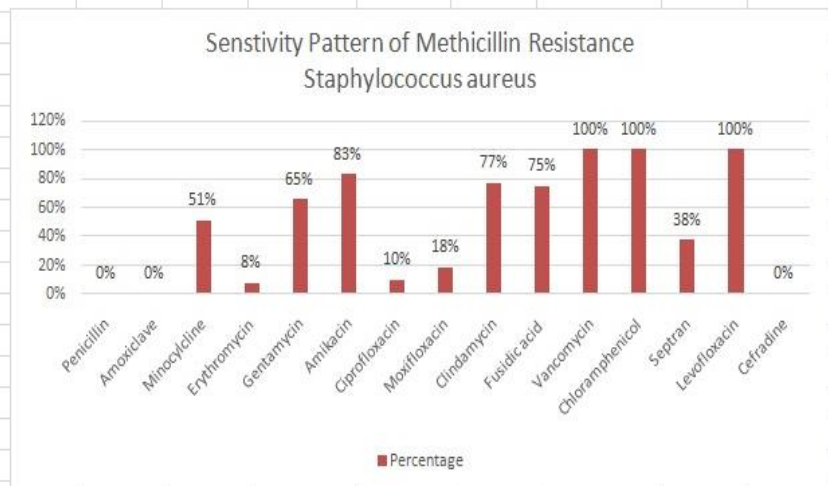


Table No. 3: Sensitivity Pattern of Methicillin Resistance Staphylococcus aureus N=158

Sensitivity Pattern of Methicillin Resistance Staphylococcus aureus N=136		
Antibiotic	Value	Percentage
Penicillin	0	0%
Amoxiclave	0	0%
Minocycline	69	51%
Erythromycin	11	8%
Gentamycin	89	65%
Amikacin	113	83%
Ciprofloxacin	13	10%
Moxifloxacin	25	18%
Clindamycin	105	77%
Fusidic acid	102	75%
Vancomycin	136	100%
Chloramphenicol	136	100%
Sepran	51	38%
Levofloxacin	136	100%
Cefradine	0	0%



Sensitivity Pattern of methicillin resistance staphylococci aureus was penicillin 0%, amoxiclave 0%, minocycline 51%, erythromycin 8%, gentamycin 65%, amikacin 83%, ciprofloxacin 10%, amoxifloacin 18%, clindamycin 77%, fusidic acid 75%, vancomycin 100%, chlorophenacal 100%, sepran 38%, levofloxaicin 100%, cefradine 00%, as shown in table 3.

The incidence of sensitivity pattern of Con staphylococci aureus was maximum in antibiotic linezolid 49 (100%) and minimum in penicillin 00 (0.0%) as shown in table 1.

The incidence of sensitivity pattern was the highest linezolid, cefradine, augmentin & vancomycin 158 (100%) respectively and the lowest in penicillin 1(1%) as shown in table 2.

DISCUSSION

One of the most common causes of disease originating in a hospital contamination in the recent work setting is methicillin repellent Staphylococcus aureus (MRSA). Its increasing incidence is a major risk to our medical care system as it not only increases the hospital admissions but also connect with increased death rates.¹⁴ The incidence of MRSA and its antibiotic susceptibility pattern is a substantial assistance for a medical expert to treat such ailments.¹⁵ The incidence of MRSA found in the above work is sixty three point thirty eight percent, which is in considers with the Iranian work showing the incidence about sixty percent.¹² The incidence of MRSA in a present work

done in Peshawar, Pakistan was thirty six percent, which is less than found in our work.¹⁶ This difference is due to the change in the conditions environment, variations season, difference in blood culture system, and type of sick person people.¹⁶ The steady rise in the appearance of methicillin repellent *Staphylococcus aureus* (MRSA) and its relationship with misuse of antibiotics is a cause of apprehension not only for doctors but also for expert of microbiology and constitute a major international danger. The frequency of MRSA in our work was highest in pus (seventy nine percent), followed by blood (fifteen percent), while the frequency of MSSA is eighty two percent in pus and ten percent in wound swab. This was coincidence to a work done Ethiopia, where prevalence of staphylococcus aureus both methicillin repellent and reactive is highest in pus (fifty five percent).^{17,18} The result was also in coincides with Indian works reporting highest incidence of MRSA in pus after blood.^{19,20} Between antibiotics, majority of staphylococcus aureus, both methicillin repellent and methicillin reactive was susceptible to chloramphenicol, (seventy two percent for MRSA) and (seventy one percent for MSSA). Antibiotic reactivity against doxycycline is also high as compared to other antibiotics. All isolates are hundred percent reactive to Vancomycin and linezolid. Similar findings are also found in a work carried out in Northern areas of Jordan in 2015.¹⁸ Vancomycin and linezolid are the only antibiotics showing hundred percent reactivity to all staphylococcus isolates, which is also found in works done in different areas of Asia.^{1,2} Same pattern of reactivity against Vancomycin was also found in a present work done in Namibia.²³ One of the most important point taken from the above data is the increasing repellent of ciprofloxacin (seventeen percent reactive) for MRSA. The emergence of repellent of ciprofloxacin (seventeen percent reactive) is a characteristic feature of the present work. This may assumable linked to the inappropriate antibiotic use in hospital setup and outpatient departments.^{22,23}

CONCLUSION

The antibiotic susceptibility pattern derived from the above work showed a lot of antimicrobial chances available for staphylococcus aureus, so the use of Vancomycin and linezolid should be the last centre for treating such infections. It also draws attention towards increasing repellent between the widely used antibiotic such as ciprofloxacin so its overuse should be discouraged.

Author's Contribution:

Concept & Design of Study: Madiha Mumtaz
 Drafting: M Rafique, Adul Sattar
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 Revisiting Critically: Madiha Mumtaz, M

Rafique

Final Approval of version: Madiha Mumtaz

Conflict of Interest: The study has no conflict of interest to declare by any author.

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