Original Article

Drug sensitivity pattern of microorganisms in infected wounds at TUTH

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Introduction: The spread of antibiotic resistance and the appearance of multiple antibiotic resistant pathogens have been recognized by the WHO as a serious problem that complicates medical treatment of bacterial infections. Present study is a retrospective study from 15June to to 15th December 2004, which includes 1379 pus samples.
Methods: Culture and sensitivity testing for pus samples was done using standard Microbiological protocol in TUTH microbiology laboratory.
Results: We found that Staphylococcus aureus is the commonest isolate (57.25) followed by E. Coli (15.61) The most effective antibiotic in-vitro for Staphylococcus aureus is Cloxacillin (87.0) followed closely by Erythromycin (81.8). In E. coli, the most effective antibiotics was Amikacin (77.88). Pseudomonas was isolated in only in (5.83) cases. The most effective antibiotic in vitro was Amikacin (47.22) and Ciprofloxacin (47.22) followed by Gentamycin (32.6).
Conclusion: With rampant antibiotic use, the drugs become resistant of which the clinicians may not be aware. Similarly, the organism pattern may differ in different hospitals. So, we believe that such regular update to our clinicians will help them use appropriate antibiotics, as they will be aware of the prevalent organism and the most effective antibiotic to it.
Key words: Drug sensitivity pattern, antibiotic resistance

Introduction

The antibiotic resistance problem is global, confronting, communities and nation worldwide [1]. The cost of antibiotic resistance continue to rise, and is a serious threat to the treatment of infectious diseases[2]. Present study is continuation of surveillance we are doing every 6 months to monitor drug resistance and to guide empirical drug treatment in TUTH.

Aims and objectives

Our aim was to find out antibiotic sensitivity pattern of bacterial isolates of pus samples.

Material and methods

This study was done in Dept. of Clinical Microbiology with help of Surgery Dept. This is a retorspective study done for 6 months from 15th June to 15th December. Total 1379pus samples (out patient and admitted patients) were included and processed in Microbiology Dept. using standard microbiology protocols.

Results

Out of 1379 pus samples, 745 samples did not show growth of bacteria. Among 634 samples which showed bacterial growth Staphylococcus was the commonest isolate followed by Escherechia coli, Klebsiella species and Pseudomonas Species. Few samples had more than one bacterial isolate *(Table 1)*.

Table 1. Bacterial isolates

Bacterial Isolate	No. of Isolates	%
Staphylococcus aureus	363	57.25
Escherechia coli	104	15.61
Klebsiella sp	50	7.88
Pseudomonas sp	37	5.83
Acinetobacter sp	12	1.89
Citrobacter sp	21	3.31
Proteus sp	21	3.31
Providencia	3	0.47
streptococcus sp	7	1.1
Enterococcus faecalis	20	3.15
Serratia sp	1	0.15

Staphylococcus was most common isolates accounting for 363 (57.25). Cloxacillin was most effective antibiotic in vitro

for Staph. aureus followed by Erythromycin *(Table 2-5)*.

Table 2. Sensitivity Pattern of Staphylococcus aureus:

Antibiotics	% of sensitive Staphylococcus aureus
Cloxacillin	87.0
Ciprofloxacin	74.3
Erythromycin	81.8
Cephalexin	76.3
Ampicillin	32.5

Escherehia coli was second commonest isolate and in vitro Amikacin, was most effective antibiotic in vitro.*(Table 3)*

Table 3: Antibiotic Sensitivity Pattern of Escherichia coli

Antibiotics	% of sensitive Escherichia coli
Amikacin	77.88
Ciprofloxacin	40.42
Gentamycin	55.7
Cephalexin	28.8
Ampicillin	39.3
Cotrimoxazole	32.0

Table 4: Antibiotic Sensitivity Pattern of Klebsiella sp.

Antibiotics	% of sensitive Klebsiella sp
Amikacin	58.0
Gentamycin	56.0
Ciprofloxacin	42.0
Cephalexin	24.0
Cotrimoxazole	17.3

Table 5: Antibiotic Sensitivity Pattern of Pseudomonas sp.

Antibiotics	% of sensitive Pseudomonas sp.
Amikacin	47.22
Ciprofloxacin	47.22
Gentamycin	32.6

Discussion

Scientists and health professionals agree that decreasing the incidence of antimicrobial resistance will require improve system for monitoring outbreaks of drug resistant infections and a more judicious use of antimicrobial drugs. In our study Staphylococcus aureus was most common organism (57.25) folllowed by Escherechia coli (15.61). This is same as our previous study (Baishak to Ashwin) [3.] . Most effective antibiotic for Staphylococcus aureus is Cloxacillin (87) followed by Erythromycin (81.8) in our study. In a study done in north Lebanon 70% of Staphylococcus aureus strains were sensitive to Cloxacillin and 87% strains were sensitive to Erythromycin [4] where as in our study only 81.8 Staph. aureus strains were sensitive to Erythromycin. Ampicillin was only effective for 32.5% of isolates in our study. Ampicillin is very frequently used in clinical practice even without prescription, may be this is the cause of reduced effectiveness of the drug. For Escherechia coli Amikacin was very effective in vitro. For other gram negative bacilli Amikacin were very effective (80%-90%). Ciprofloxacin was effective for around 50-60% of gram-negative bacteria.

Conclusion

Drug resistant microorganisms those that are not killed or inhibited by antimicrobial compounds are an increasingly important public health concern. The innate adaptability of microbes is complemented by the widespread and sometimes inappropriate use of antibiotics. Educational projects for physicians and patients should be emphasized. Antibiotic use must improve so as to preserve efficacy of the drugs we have. The surveillance data should be disseminated effectively, so that it can be used to guide empirical antibiotic therapy and to monitor antibiotic resistance.

References

1. Antimicrobial Resistance, *NIAID Fact Sheet*.
2. *CMAJ*. October 15, 2002; **167(8)**
3. Singh A, Vaidya P, Tuladhar NR, Antibiotic Sensitivity pattern of Microorganisms of Infected Wound in TUTH, *J Institute Med*. 2003;**25:** 17-18.
4. Hamze M, Dabboussi, Daher W, Izard. Antibiotic resistance of Staphylococcus aureus at north Lebanon. *Pathol Biol (Paris)* 2003; **51:**21-6.
5. Singh A, Vaidya P, Tuladhar NR, Antibiotic Sensitivity pattern of Microorganisms of Infected Wound in TUTH, *J Institute Med*. 2004; **26:** 39-40