SENSITIVITY AND RESISTANCE OF ANTIBIOTICS IN COMMON INFECTION OF MALE AND FEMALE

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Background: There is increasing concern regarding antimicrobial resistance in Pakistan. Data are limited on the prevalence, pattern of resistance and risk factors associated with resistant organisms. This Study was done to address these issues as they relate to common infection of male/female. **Methods:** Different clinical materials collected from 100 patients admitted in hospital or who attended out door clinic were used. Antibiotics like Enoxabid, Fortum, Ceporex, Klaricid, Maxaquin, Zenacef, Ceporexin, Urixin, Septran, Keflex, Erythrocine, vibramycin and tetracycline were used for culture sensitivity. **Results:** It was observed that most of the pus specimens received are from females and urine specimens from males. Specimen of pus contains mostly Staph aureus, Urine specimen contain mostly E.coli whereas Pseudomonas pyrogenosa and proteases were also observed in urine, pus, sputum and ascitic/pleural fluids of patients. Among all drugs that were used, Enoxabid, Ceporex were vary sensitive against strains of Staph and Pseudomonas present in specimen. Strains of proteases were resistant against these drugs. Urixin and Septran show mixed action. In comparison of Enoxabid, Ceporex and Ceporexin, Zenocef and Fortum show sensitivity in fewer cases of Staph and E.coli. Mexaquin shows a good sensitivity against Pseudomonas and E.coli. It was observed that Septran, Erythrocine, Vibramycin, Tetracyclin, Klaracid and Keflex are not very good acting drugs in infection of urine, pus, sputum and fluids. Finding of a low but definite level of resistance to septran, erythrocine, Vibramycin, Tetracyclin, Klaracid and Keflex is important for selection of empiric therapy for infection.

INTRODUCTION

An ideal antibiotic exhibits selective toxicity against microorganism. Mechanisms of antibiotic action are not completely understood. However they may inhibit cell wall synthesis, alter permeability of cell membrane, inhibit protein synthesis or nucleic acid synthesis.

Initial step in the drug action is the binding to cell receptor as various receptors may possess different affinities for drugs and each may mediate a different mode of action[1]. Susceptibility of bacteria to beta lactum antibiotics depends on various structure and functional characteristics. In order to reach receptor the drug must permeate the outer layer of cell envelope. In gram –ve bacteria, there is an outer phospholipid membrane that may hinder passage of these drugs. It is observed that hydrophobic drug like ampicillin, amoxacillin may pass more readily than penicillin. In gm +ve bacteria, phospholipid membrane is lacking and its barrier function is absent[2]. Most of the beta lactamase are under the gene control of plasmid. Such gene bearing plasmids are wide spread among staphylococci and enteric gram –ve rods. These bacteria produce beta lactamase ring that inactivates some penicillin by breaking beta lactum ring. Some bacteria may be insusceptible to the killing action of autolytic enzyme in cell wall and not activated like staphylococci and streptococci. Such tolerant ones are inhibited but not killed[3].

There is an increasing concern regarding antimicrobial resistance in Pakistan. Data are limited on the prevalence, pattern of resistance and risk factors associated with resistant organisms. This study was done to address these issues as they relate to common infection of male/female.

MATERIALS AND METHODS

Pathogenic organisms are most likely to be isolated from sputum, wounds, urinary tract, ascitic and pleural fluids etc. Clinical material collected from 100 patients admitted in hospital or who attend out door clinic was used. Antibiotics like Enoxabid, Fortum, Ceporex, Klaricid, Maxaquin, Zenacef, Ceporexin, Urixin, Septran, Keflex, Erythrocine, vibramycin and tetracycline used for culture sensitivity.

Media for growth of microorganisms was Blood culture plates where 2% nutrient agar was mixed with sheep blood in a ratio of 20:1[4]. Media used for culture sensitivity was 2% nutrient agar. Sensitivity of different strains were checked by streaking overnight cultures onto nutrient agar having different concentrations ranging from 25ug/ml to 1000ug/ml of antimicrobial drug[4].Gram Staining was carried out by using crystal violet and iodine[4].

RESULTS

The results of this study are given in tables 1-3.

Table-1: Specimen with Infection in Male/Female Patients

Specimen	Male	Female
Pus	5	16
Urine	51	16
Sputum	5	3
Fluids (Ascitic/pleural)	6	1

Table-2: Prevalence of Microorganism in Specimen Collected from Male/Female Patients

Organisms	Urine	Pus	Sputum	Fluids
Staph. Aureus	6	45	6	1
E.coli	16	5	1	3
Ps.pyrogen	3	11	1	-
Proteus. Mirabilis	2	10	-	2

Table-3: Sensitivity/Resistance of Antibiotics against Microorganisms

Antibiotics	Sensitivity to Organisms	Resistant Organisms	Specimen
Enoxabid	Staph, Pseudmonas	Proteases	Pus
Ceporex	Staph, Pseudomonas	Proteases	Pus
Ceporexin	Mixed action	Pseudomonas. Proteases, Staph	Pus
Urixin	Mixed action	Pseudomonas, Proteases,Staph	Pus & Fluid
Septran	Not good sensitivity	Pseudomonas, Proteases, Staph & E.coli	Pus, Urine, Sputum and Fluids
Zenocef	Sensitive in many cases against Stpah & E.coli	Pseudomonas, Proteases	Pus & Urine
Fortum	Sensitive in many cases against Staph & E.coli	Pseudomonas	Urine
Erythrocine	Not a good sensitivity	Pseudomonas, Proteases, & Staph	Pus, Urine
Vibramycin	Not a good sensitivity	Psedomonas, Proteases & Staph	Pus, Urine
Tetracyclin	Not a good sensitivity	Pseudomonas, Proteases, & Staph	Pus, Urine
Klaracid	Not a good sensitivity	Pseudomonas, Proteases, & Staph	Pus, Urine
Keflex	Not a good sensitivity	Pseudomonas, Proteases, & Staph	Pus, Urine
Mexaquin	Good sensitivity against Pseudomonas & E.coli	Proteases & Staph	Pus

DISCUSSION

Most of the pus specimens were received from females while urine specimens were from males (may be due o poor hygiene in males). Pus specimens were received from wounds of female mostly admitted in Gynae and Obstetic ward. It was thought[5] that contamination of wound sites may be due to surgical handling of excised tissue or may be due to hygiene problems. It was reported[6] that genital chlamydial infection is a common sexually transmitted infection that is often asymptomatic, but associated with long term morbidity in a sizeable proportion of women.

Table 2 shows that specimen of pus contained mostly Staph aureus, Urine specimens contained mostly E.coli whereas Pseudomonas pyrogenosa and proteus mirabilis were also observed in urine, pus, sputum and ascietic/pleural fluids of patients. As less specimens of sputum and fluid were received so we cannot be sure about their organism and drugs.

Table 3 shows resistance against microorganisms like Staph, Pseudomonas, Proteases and E.coli. It was observed that among all drugs used, Enoxabid, Ceporex are very sensitive against strains of Staph and Pseudomonas present in specimen. These show resistance against strains of proteases. Urixin and Septran show mixed action i.e in some cases these are sensitive and in others there is resistance. It was thought[1] that it may depend on the exposure of person to drugs or it may be possible that patient do not complete the antibiotics course. A study[7] concluded that antibiotics do not enter the lactamase ring of organisms.

In comparison to Enoxabid, Ceporex and Ceporexin, Zenocef and Fortum show sensitivity in fewer cases of Staph and E.coli. Mexaquin shows good sensitivity against Pseudomonas and E.coli. It was observed that Septran, Erythrocine, Vibramycin, Tetracyclin, Klaracid and Keflex are not very good acting drugs in infection of urine, pus, sputum and fluids.

A group of workers reported[8] that most of antibiotics are inactive or weakly active against Eukaryotic ribosome especially E.coli. They observed that Aminoglcosides, a group of structurally related antibiotics bind to rRNA in small subunit of prokaryotes. Another group observed[9] that a small percentage of children/adults seen in private practice of European countries who have apparent viral respiratory tract infection with sore throat are group of a ß hemolytic streptococcus (GABHS) carrier. Penicillin treatment of acute GABHS tonsillo pharyngitis results in higher GABHS carriage rate that was treated with cephalosporin and macrolides. It was reported[10] that selective antimicrobial pressure and multiple admission to hospital were among the risk factors associated with antimicrobial resistance. Finding of a low but definite level of resistance to Septran, Erythrocine, Vibramycin, Tetracyclin, Klaracid and Keflex is important for selection of empiric therapy for infection. It was thought[11] that long term use of these resistant antibiotics might cause agranulocytosis that may lead to fatal diseases such as leukopenia or leukemia. Long term use of resistant antibiotic may also suppress host bacteria or increase growth of pathogens that may result in further complications.

CONCLUSION

Role of first line agents in the treatment and prevention of urine/wound and other infection require reexamination, particularly in women/men who have received antimicrobial therapy.

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