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ANTIBIOTIC RESISTANCE AND ANTIBIOTIC INDUCED SEIZURE IN A CHRONIC RENAL FAILURE PATIENT

[1]Dr.MD Amer Khan *, Aziz ullah G, M.S Adil, Mohammed Maazuddin, Ihtisham sultan, Nematullah M.

[1]PharmD, Clinical Pharmacist, Department of Pharmacy Practice, Owaisi Hospital And Research Centre, Deccan School Of Pharmacy (DSOP) Hyderabad – 500024, Andhra Pradesh.

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***Correspondence for Author:**
Dr. MD Amer Khan
PharmD, Clinical Pharmacist, Department Of Pharmacy Practice, Owaisi Hospital And Research Centre, Deccan School Of Pharmacy (DSOP) Hyderabad, Andhra Pradesh
dr.amairkhan.pharmd@gmail.com

ABSTRACT

Within the life period, antibiotic resistance has become a major health problem due to increase in the antibiotic utilization over 60 years. Antibiotic resistance occurs before or during the treatment course. Infection is the second leading cause of death in dialysis patients i.e 100 to 300 times more than sepsis. 24% of the infections are related to only dialysis in which Staphylococci organisms are the most common. A 63 old female patient was admitted in the hospital with complaints of fever, burning micturition with decreased urinary output since 1 week, puffiness of face since 2 days and patient was in altered mental state since 2 days, and anorexia. diagnosis made was acute CKD/uremic encephalopathy/septic shock with LRTI/UTI. Ofloxacin induced seizure has been evaluated in this CRF patient and the score found on naranjo scale is 6 i.e probable. The renal failure patient should be carefully monitored with anitbiotics and doasage adjustment should be done if possible.

Key words: antibiotic, anorexia, patient.

INTRODUCTION

Within the life period, antibiotic resistance has become a major health problem due to increase in the antibiotic utilization over 60 years. Antibiotic resistance occurs before or during the treatment course.[1] Resistances to tetracycline, vancomycin and erythromycin,

streptomycin, clindamycin, gentamicin, oxacillin and lincosamide are common in Lactobacillus species. [2]

The molecular mechanisms of antibiotic resistance is more complex and diverse. The most frequent type of resistance is acquired and transmitted horizontally via the conjugation of a plasmid. The indiscriminate and inappropriate use of antibiotics in outpatient clinics and hospitalized patients is the important factor leading to antibiotic resistance.[3]

Each year in the United States, at least 2 million people become infected with bacteria that are resistant to antibiotics and at least 23,000 people die each year as a direct result of these infections. Many more people die from other conditions that were complicated by an antibiotic-resistant infection. [4]Infection is the second leading cause of death in dialysis patients i.e 100 to 300 times more than sepsis.24% of the infections are related to only dialysis in which Staphylococci organisms are the most common [5]

CASE REPORT

A 63 old female patient was admitted in the hospital with complaints of fever, burning micturition with decreased urinary output since 1 week, puffiness of face since 2 days and patient was in altered mental state since 2 days, and anorexia since 1 day.

Past medical history

Type 2 diabetes milletus since 10 years but the patient is not on Rx since 1 month and hypertension since 7 years.

1st day

On the examination the patient was hypotensive i.e 100/50 mm Hg, pulse rate was normal 86/min and 4 episodes of vomiting.

The physician advised the following test.

- Complete blood picture
- Biochemistry
- Radiology
- 2D echo

The physician prescribed:

Table: 1 Treatment

S No	Drug	Dose	Route	Frequency
1.	IV fluids normal saline+ringer lactate	75ml/hour	Intravenously	whenever necessary
2.	Injection erythropoietin	4000 units	Sub-cutaneously	twice a day
3.	Tablet aspirin	150 mg	Oral	Once a day
4.	Tablet atorvastatin	20 mg	Oral	once a day
5.	Tablet clopidogrel	75 mg	Oral	Once a day
6.	Tablet clonazepam	0.5 mg	Oral	Onc a day
7.	Injection furosemide	20 mg	Intravenously	Thrice a day
8.	Injection dobutamine	250mg/20 ml	Intravenously	Whenever necessary
9.	Dextrose	25%	IV	whenever necessary
10 11.	Nebulization Ipratropium Bromide + Salbutamol Dialysis	500mcg / 2.5mg	Nasal	twice a day whenever necessary

Day 2

On day 2, the temperature was 98.6, blood pressure was 140/90 mm Hg and pulse rate was 97/min. the patient also complaints about the blood from oral cavity. The physician added tablet lomifloxacin 250 mg once daily to the regimen.

The investigated (abnormal) reports are as follows:

Table: 2 Laboratory Values

S. No	Lab Parameter	Lab Value	Normal Value
1.	Haemoglobin	7.3 × 103 / Mm3	4 – 10
2.	Po2 conc.	56.8 mm Hg	80-100
3.	Pco2 conc.	28 mm Hg	35-45
4. 5.	C-reacting proteins potassium	48 µg/Ml 3.3 m.mol/lit	- 3.5-5

6. 7.	blood urea serum creatinine	137 mg/dl 8.2 mg/dl	10-50

Radiology and imaging shows increased echotexture of kidneys with loss of cortico-meduallary differentiation with grade 3 renal parenchymal disease.

2D-ECHO shows moderate left ventricular dysfunction.

After receiving the reports the provisional diagnosis made was acute CKD/uremic encephalopathy/septic shock with LRTI/UTI.

DAY 3

On day 3, the patient BP was 145/90 and patient was prescribed tablet amiodarone 200 mg once daily with tachypnoeai.e 120/min.

ECG shows spiky baseline with broad QRS. Haemodialysis was done to the patient and same treatment was given.

Day 4

On day 4 the temperature, blood pressure and pulse rate was above normal.

The physician advised culture sensitivity test.

Culture sensitivity

Si.no	Sensitive to	Resistant to
1.	Amikacin	Cefotaxime
2.	Capreomycin	Cylindamycin
3.	levofloxacin	Lomefloxacin
4.		Sulbactam
5.		Ceftriaxone
6.		Cefadroxil
7.		Ciprofloxacin
8.		Ceftazidime

Day 5

After receiving the culture sensitivity test, the physician changed the antibiotic to cefoperazone IV 1.5 gm

Day 6

Case of 1 episode of seizure occurred in the morning. Tablet clonazepam 0.5 mg OD and tablet ivapred 5 mg OD was added.

Day 7

There was no fresh complaints on day 7 and patient was discharged with the discharge medications.

DISCUSSION

The frequency of Antibiotic resistance are increasing nationally and internationally. The strong reason includes the indiscriminate use of antibiotics, use of antibiotics in the treatment of infections, transfer of resistance from one pathogen to another and the spread of colonisation from one patient to the next. [6]

MECHANISMS OF ANTIBIOTIC RESISTANCE

Selective advantage

The resistance genes in the bacteria has a selective advantage which are sensitive to antibiotics in multiplication which can be easily spreadable.

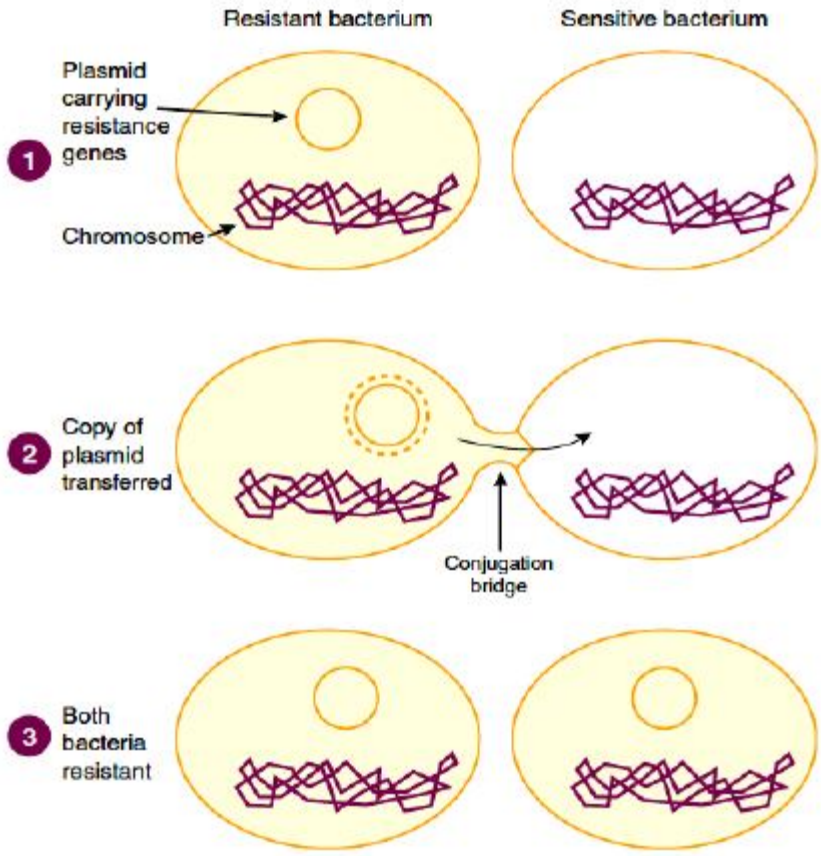
Genetic transfer

Transfer of genetic material from a resistant bacteria to sensitive bacteria either of same species and genera or different makes sensitive bacteria a resistant one. This transfer may be carried out by conjugation and also done by plasmids or transposons in a clonal manner. [7]

THERAPEUTIC STRATEGIES

The empiric antibiotic regimen for dialysis-related peritonitis should have adequate coverage against the pathogens that most commonly cause peritonitis, taking into account the prevalences and patterns of resistance of pathogens at that institution, and the patient's previous culture results. Current guidelines recommend the use of a first-generation cephalosporin (for example, cefazolin) against gram-positive bacteria, with the potential for using vancomycinin patients with severe allergy to b-lactams (47). An anti-pseudomonal agent should be included for gram-negative coverage, which generally involves the use of a

third- or fourth-generation cephalosporin (for example, ceftazidime or cefepime) or an aminoglycoside (for example, gentamicinoramikacin). A combination of two cephalosporinsshould be used only when the patient's urine output is more than 100 mL daily (48). fluoroquinolones produce high drug concentrations in the peritoneal dialysate, their use is limited by the fact that resistance among gram-positive and gram-negative bacteria alike are alarmingly high in many centers. Known-pathogen therapy against multiresistantpathogens is problematic, and few clinical trials of new antibiotics or alternative agents are currently underway. [8][9]



PREVENTIVE STRATEGIES

The risk factors associated with colonization or infection by resistant bacteria follow a similar pattern. Colonization and infection tend to be more common among patients requiring prolonged hospitalization, those with significant underlying diseases and indwelling devices, and in particular, those exposed to multiple broad-spectrum antibiotics. The antibiotics in question vary with the bacteria. For gram-positive bacteria, exposure to vancomycin is the main risk factor. For the Enterobacteriaceaeand non-fermenters, third-generation cephalosporins, carbapenems, and fluoroquinolones are commonly implicated.

Primary pre Primary prevention for the emergence of resistant bacteria is impossible, given that many patients with chronic comorbidities require frequent hospitalizations, indwelling devices, and antibiotic use. Judicious use of antibiotics is the clearly the prerequisite and should focus on the extended-spectrum cephalosporins, carbapenems, and glycopeptides (54). An antibiotic stewardship program should be part of every hospital's antibiotic policy. Rational choice of antibiotics (for example, a shift from extended-spectrum cephalosporinsto ureidopenicillins) and compliance from clinicians can make substantial contributions to reducing the prevalence of resistant bacteria (55–57). [10-12]

CONCLUSION

Ofloxacin induced seizure has been evaluated in this CRF patient and the score found on naranjo scale is 6 i.e probable. The renal failure patient should be carefully monitored with anitbiotics and doasage adjustment should be done if possible.

CONFLICT OF INTEREST: There is no conflict of interest of any of the authors of this article.

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