ANTIBIOTIC RESITIVITY PATTERN AND ITS ADVERSE REACTION : CASE STUDY

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Abstract

An antibiotic is a naturally occurring semi-synthetic or synthetic substance used to treat both external and internal infections by destroying or inhibiting the development of pathogenic microorganisms. To maximize benefits and minimize risks, medication prescriptions must be completely rational and economic. But nowadays serious morbidity and mortality occur due to inappropriate or irrational prescriptions of antibiotics, which also leads to antibiotic resistivity, adverse reactions and economically costly. In this study, we have clinically assessed a 58-year-old adult patient for their recommended treatment through ward-round monitoring. By means of clinical pharmacist intervention, the expected occurrence of ADR is prevented which provokes the rational use of Antibiotic.

KEY WORDS: Antibiotics, Antibiotic Resistivity Pattern, Adverse Reaction

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Eur. Chem. Bull. **2023**,*12(Special Issue 1, Part-B), 4639-4644*

4639

INTRODUCTION:

The rational use of medicine was defined by the WHO in 1985 as taking place when "Patients receive medications suited to their clinical needs, in dosages that meet their individual, for an adequate amount of time, and at the lowest cost to them and their community" (1).

The irrationality in irrational prescribing occurs due to several reasons which areas follows: Overuse/Overconsumption, Multiple drug use or polypharmacy, Absence/weak of national drug policy, Faculty in adequate training and education of medical, Poor communication between health professionals and patients and Lack of Information (2).

Irrational drug use is a worldwide issue. Such as, Brand-name prescriptions, excessive antibiotic prescriptions, and excessive usage of injections are a few of the practices that contribute to the issue. Brand-name prescriptions are more frequently written, according to studies on drug use in India. The possibility of drug-drug interactions, which can result in adverse drug reactions (ADRs), higher medication load on patients, and unnecessarily high drug expenses are all linked to polypharmacy. Antibiotic overprescribing raises the expense and risk of drug resistance (3).

Recent results demonstrate that resistant organisms have also been found in patients receiving primary care, even though antibiotic resistance has historically mostly been a clinical issue in hospital settings (4).

Antimicrobial Resistant (AMR) has become a significant threat to public health, with estimates that by 2050 it would be responsible for 1 crore annual mortality. Due to resistance to first-line antibiotics, more than 50,000 infants every year pass away from sepsis. Antibiotic misuse and overuse are major factors in the development of antibiotic resistance, which could have detrimental effects on human health (5).

Antibiotic resistance happens when an antibiotic is no longer capable of eradicating or controlling bacterial growth (6).

Due to modifications in mucosal immune system responses, patients with allergic diseases are thought to be more susceptible to developing bacterial infections (7).

This case illustrates the inappropriate use of antibiotics and which leads to adverse reaction.

CASE REPORT:

A 58-Year-old male patient was admitted to a tertiary care hospital. His weight - 116kg, height-156cm. He was allergic to Amoxicillin, Ampicillin, Penicillin, and NSAID drugs.

Chief complaints: C/o Left side leg 1st toe swelling and pain with black colour discoloration, open wound that are slow to heal , numbness in the feet.

Present medication history: No H/o Chest pain, palpitation, breathlessness, cough, cold, abdomen pain, loose stools.

Past medication history: Known case of Diabetes Mellitus under treatment, Hypertension under treatment.

Surgical History: Haemorrhoidectomy Cyst surgery-2017.

Physical examination: On arrival the patient was Conscious, Oriented, Afebrile, PR-84/Min, CVS-S1S2+, RS-BAE+, P/A-Soft, CNS: NFND. The patient was admitted & investigations revealed CBC, B.Urea, S.Creatinine, PT, INT, S.Electrolytes, T3, T4 & TSH were normal. Anti-HCV, HbsAg, HMVI & HIV || antibodies were negative. ECHO revealed EF -66.28%, concentric hypertrophy of LV & grade I LV diastolic dysfunction.

Eur. Chem. Bull. 2023,12(Special Issue 1, Part-B), 4639-4644

4640

Abnormal laboratory: Findings revealed high values CBG: 150 mg/dl, BP: 160/120 mm of Hg. Based on the symptoms and clinical findings, the physician diagnosed an Infected diabetic foot ulcer with Abscess Diabetes mellitus and the patient was treated with following medicines.

BRAND NAME	GENERIC NAME	DOSE	ROUTE	FREQUENCY
Tablet-Amlong	Amlodipine	5mg	PO	OD × 1 day
Tablet-Triglynase	[Glimepiride1mg+ Metformin500mg+ Pioglitazone15mg]	1mg	PO	BD× 3days
Injection Augmentin	Amoxicillin+ Clavulanic acid	1.2gm	IV	BD×1day
Injection-Pan	Pantoprazole	40mg	IV	OD× 1 day
Injection-Emeset	Ondansetron	4mg	IV	ODx 1 days

Due to the Irrational use of antibiotics, an Adverse reaction was found when Injected with Augmentin 1.2gm on IV following which he developed shivering with itching over the body associated with Erythematous Urticarial rashes (+) in both forearms, Diagnosis as Acute Urticaria (Augmentin induced). It was treated with following medication.

BRAND NAME	GENERIC NAME	DOSE	ROUTE	FREQUENCY
Injection. Decadron	Dexamethasone	1cc	IV	SOS
Injection Avil	Pheniramine maleate	2cc	IV	Q8H× 3 days
Injection taxim	Cefixime	1gm	IV	BD

Dermadew caloe lotion (rash) x 1 week and the patient was stable after treatment and he is fit for the procedure with monitor BP & CBG.

ANTIBIOTIC RESISTIVITY PATTERN

Antibiotics	*Streptococcus aureus*		
	Resistance	Moderate sensitivity	Sensitivity
Ampicillin	-	-	1
Amoxicillin clavulanic acid	-	-	1
Piperacillin/ Tazobactam	1	-	-
Azithromycin	1	-	-

Eur. Chem. Bull. 2023,12(Special Issue 1, Part-B), 4639-4644

4641

Cefpodoxime	-	1	-
Cefixime	-	-	1
Cefotaxime	1	-	-
Ciprofloxacin	1	-	-
Vancomycin	-	-	1
Clindamycin	-	-	1
Gentamicin	-	1	-
Doxycycline	-	-	1
Meropenem	-	-	1
Imipenem	-	-	1

Patient was resistive to Piperacillin/ Tazobactam, Azithromycin, Cefotaxime, Ciprofloxacin and sensitivity to Ampicillin, Imipenem, Meropenem , Doxycycline, Clindamycin, Vancomycin, Cefixime and moderate sensitivity to Gentamicin, Cefpodoxime

DISCUSSION:

Risks that have been connected to excessive antibiotic use:

➢ Resistance to antibiotics rising.
➢ A rise in diseases with greater severity.
➢ A prolongation of the illness.
➢ A rise in the possibility of problems.
➢ A rise in mortality rates.
➢ Costs for healthcare are rising.
➢ An increase in the possibility of adverse events, some of which could be life-threatening.
➢ The recurrence rate has increased as a result of infectious infections.
➢ Increased medicalization of infectious diseases with self-limiting symptoms (4).

Less patients who have ever had an adverse response to any class of antibiotics are not advised to take the same medication. The allergic responses may cause skin rashes and anaphylaxis, which can cause breathing problems, and swelling of the lips, tongue, and face, among other symptoms. However, these reactions might vary greatly from patient to patient and from antibiotic to antibiotic, ranging from mild allergic reactions to severe adverse effects. To make drug treatment safe, effective, and financially prudent, early detection, evaluation, monitoring, and reporting of ADR are extremely important (5,6).

Several frequent symptoms of allergic illnesses might approximate those of bacterial infections, which is the main reason why antibiotics are overprescribed for allergic conditions(7).

To encourage rational drug usage, hundreds of millions of individuals in both developed and developing nations lack the appropriate medications, which further increase inappropriate medication use (8).

Physician can take the following actions to stop and slow the spread of antibiotic resistance through: appropriate indication, appropriate drug, appropriate patient, appropriate information, and appropriate monitoring(9).

People can take the following actions to stop and slow the spread of antibiotic resistance: Use antibiotics only as directed by a licensed healthcare provider, if a

*Eur. Chem. Bull. **2023**,12(Special Issue 1, Part-B), 4639-4644*

4642

medical professional advises you don't need antibiotics, never request them, Please heed the advice of your healthcare provider when using antibiotics, Never distribute or reuse leftover antibiotics (10).

The patient felt symptomatically better and was discharged with the following medicines:

Tablet Covance	Losartan	50mg	After food	OD
T. DIAMICRON XR HEX	Gliclazide and Metformin	500 +60	10 minutes before Breakfast and dinner	OD
T. Flagyl	Metronidazol	400mg	After food	BD+5 days
T.Ketord-DT	Ketorolac tromethamine	10mg	Afterfood	BD+15days
T. Pan	ondansetron	40mg	Beforefood	OD+5days
T.Allegra	fexofenadine	180mg	Afterfood	BD5days
T.Medrol	Methylprednisolone	4mg	Afterfood	BD5days.

CONCLUSION:

The patient was symptomatically better now due to inappropriate use of an antibiotic, patient was extended for hospitalization which also leads to cost maximization (economically burden) to the patient. Which provokes the Rational use of medicine.

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4643

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Eur. Chem. Bull. 2023,12(Special Issue 1, Part-B), 4639-4644

4644