A STUDY OF THE PRESCRIBING PATTERN OF ANTIBIOTICS AMONG THE SURGICAL IN-PATIENTS ON THE BASIS OF WHO AWaRe CLASSIFICATION IN A TERTIARY CARE HOSPITAL IN IMPHAL

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ABSTRACT

Introduction: Antibiotics are crucial in management of various forms of infections so as to decrease morbidity and mortality. ***Objective:*** The aim of this study is to analyse the prescribing pattern of antibiotics among the surgical in-patients on the basis of the WHO AWaRe classification. ***Method:*** Data was collected from 525 case sheets of the surgical in-patients for a period of 1 year. Collected data included age, sex, diagnosis, name of antibiotics, co-prescribed drugs, route of administration, duration of treatment, adverse drug reactions/ events and duration of hospital stay which was entered in a pre-designed form. Descriptive statistics was used for analysis of the data. ***Results:*** 22.3% antibiotics was used in the age group of 31-40 years as single drug (51.4%) given via intravenous route (92%) with the most common class being Cephalosporins (34.4%). ACCESS group comprised of 59.28% of antibiotics in total with the average duration of stay being 3.8 days. ***Discussion:*** WHO has developed the WHO AWaRe classification to decrease the problem of antimicrobial resistance going hand-in-hand with the Antibiotic Stewardship Program. Cephalosporins accounted for the major class of drug use with Ceftriaxone alone used with 34.4%. ACCESS group of the AWaRe classification comprised of 59.28% of the total antibiotic use in the study with the average duration of stay of the patients being 3.8 days. ***Conclusion:*** Differential diagnosis for as to spill out why physicians do not follow guidelines and WHO approach towards improving prescription pattern needs utmost attention and intervention so as to improve the quality of life of the patients thereby decreasing patient morbidity and mortality.

KEYWORDS: Antibiotics, Ceftriaxone, Cephalosporins, AWaRe, WHO, Antibiotic Stewardship Program.

INTRODUCTION

Antimicrobial agents particularly Antibiotics are the essential drugs for the practicing physicians otherwise their clinical practice won't be successful. They prescribe antimicrobial agents for their customers/ patients on the basis of their clinical knowledge and experience. During this time, they tend to use the antimicrobial agents irrationally and inappropriately without microbial sensitivity testing, so that their customers may regard them as the best and experienced physicians of their time.[1,2,3]

Sometimes the prescribers prescribe the antimicrobial agents without following the 5-rules guidelines. Over and above this, the customers/ patients consume antimicrobial agents with their own knowledge and decision, without consulting the eligible person. The pharmacist/ medical representatives sell their antimicrobial agents as OTC or as a substitute item of the original antimicrobial agents.[4]

In this situation, there is a chance of development of antimicrobial resistance. Therefore, the available antimicrobial agents may not be able to control the microbes and at length, there may not be any antimicrobial agents to treat patients with infections in future.[5,6]

In order to tackle the few percentages of the problem of antimicrobial resistance, WHO developed the AWaRe classification of antibiotics with regard to the Antibiotic Policy and the Antimicrobial Stewardship (AMS).[7,8,9]

Therefore, educating the prescribers and HCW/HCP about the rational and appropriate prescribing of antibiotics is crucial for reducing antimicrobial resistance. As it is little known about antibiotics prescription pattern based on WHO AWaRe classification in Primary Health Care Hospitals. The present study is taken up to assess the antibiotics prescribing pattern in in-patients of a tertiary care hospital.[10,11,12]

AIMS AND OBJECTIVES

To analyse the prescribing pattern of Antibiotic Prescription pattern of surgical in-patients according to the WHO AwaRe classification

MATERIALS AND METHOD

Study design and setting
It is a retrospective cross-sectional study conducted in the premises of Shija Academy of Health Sciences, Langol.

Data collection
Case sheets of Surgical in-patients of Shija Hospitals and Research Institute (SHRI) was collected for a time period of 1 year i.e., September 2021 to September 2022 and analysed in a pre-designed case form. The data collected included age, sex, diagnosis, name of antibiotics, co-prescribed drugs, route of administration, duration of treatment, adverse drug reactions/ events and duration of hospital stay which was entered in a pre-designed form.

Inclusion criteria
All case sheets of in-patients receiving antibiotics will be included in the study.

Exclusion criteria
All case sheets of Left against medical advice (LAMA), incomplete prescriptions and prescriptions without antibiotics.

Data analysis
Descriptive statistics was used for analysis of the data.

Ethical considerations
Ethical clearance is obtained from the Institutional Ethical Committee of SHRI with the order no. IEC/SHRI/22 dated 17th November, 2022.

RESULTS

The number of case sheets collected from the departments of Surgery, Orthopaedics, Obs and Gynae, Medicine and ENT for a period of 1 year was 570. Out of these, 45 were rejected.

Most antibiotics 117(22.3%) was administered in the age group of 31-40 years. 218 (41.5%) were male patients and 307 (58.5) were females and the average duration of hospital stay was 3.8 days.

The Department of Surgery treated the maximum number of 267 patients with antibiotics (50.9%).

Table 1: Demographic data.

AGE (in years)	NUMBER OF PATIENTS	PERCENTAGES
0-10	41	7.8%
11-20	37	7%
21-30	99	18.9%
31-40	117	22.3%
41-50	89	17%
51-60	71	13.5%
>60	71	13.5%
GENDER		
MALE	218	41.5%
FEMALE	307	58.5%
DEPARTMENTS		
SURGERY	267	50.9%
ORTHOPAEDICS	82	15.6%
OBSTETRICS	72	13.7%
GYNAECOLOGY	50	9.6%
MEDICINE	24	4.5%
ENT	21	4%
OTHERS	9	1.7%
	Total patients	Average stay
DURATION OF HOSPITAL STAY	525	3.8 days

The most common diagnosis which was encountered by the Dept. of Surgery was acute cholecystitis (22.5%). Other findings were fractures (15.6%), Caesarean section (13.7%), Uterine fibroid (9.5%), etc as shown in table-2

Table 2: Use of antibiotic according to diagnosis.

DEPARTMENT	DIAGNOSIS	TOTAL	PERCENTAGES
SURGERY	Acute cholecystitis	118	22.5%
	Renal calculi	52	9.9%
	Plastic surgery	33	6.3%
	Haemorrhoids	30	5.7%
	Appendicitis	23	4.4%
	Fistula	11	2.1%
ORTHOPAEDICS	Fracture/ Dislocation	82	15.6%
OBSTETRICS	LSCS	72	13.7%
GYNAECOLOGY	Fibroid	50	9.5%
MEDICINE	T2DM and HTN	24	4.5%
ENT	CSOM	21	4%
OTHERS	Foreign body, Chemotherapy, etc	9	1.8%

Multiple antibiotics were administered to 255 patients (48.6%) through 483 I/V parenteral route (92%). Single antibiotic was administered to 270 patients (51.4%) as shown in Table-3.

Table 3: Antibiotic use.

TYPE OF ANTIBIOTIC THERAPY	NUMBER OF PATIENTS	PERCENTAGES
SINGLE DRUG	270	51.4%
MULTIPLE DRUG	255	48.6%
ROUTE OF ADMINISTRATION	NUMBER OF PATEINTS	PERCENTAGES
I/V	483	92%
ORAL	42	8%

On further analysis, the use of antibiotics according to the WHO AWaRe classification, Aminoglycosides viz., Amikacin (5.4%) and Gentamicin (0.53%) consisted of 5.93% while Beta lactams with beta lactamase inhibitors comprised 46.25% and also metronidazole with 7.1% all of which are in the ACCESS group.

In the watch group, 2nd and 3rd generation Cephalosporins use was 35.43%. Flouroquinolones utilisation was 3.7% followed by both Carbapenems and Rifamycins both with 0.53%.

In the Reserve group, Oxazolidinones use was 0.53%.

Table 4: Antibiotic usage as per WHO AWaRe classification.

CLASS	ACCESS	WATCH	RESERVE
Amikacin	5.4%	NIL	NIL
Gentamicin	0.53%	NIL	NIL
Amoxicillin+ Clavulanic Acid	6.1%	NIL	NIL
Piperacillin+Tazobactam	12.9%	NIL	NIL
Cefixime+Clavulanic Acid	14.01%	NIL	NIL
Ceftriaxone+Tazobactam	8.9%	NIL	NIL
Ceftriaxone+Sulbactam	4.34%	NIL	NIL
Metronidazole	7.1%	NIL	NIL
Ceftriaxone	NIL	34.4%	NIL
Cefixime	NIL	0.53%	NIL
Cefuroxime	NIL	0.4%	NIL
Cefpodoxime Proxetil	NIL	0.1%	NIL

Levofloxacin	NIL	3.3%	NIL
Ofloxacin	NIL	0.4%	NIL
Meropenam	NIL	0.53%	NIL
Rifaximin	NIL	0.53%	NIL
Linezolid	NIL	NIL	0.53%
TOTAL	59.28%	40.19%	0.53%

DISCUSSION

Indiscriminate prescribing and use of antibiotics have led to the development of antimicrobial resistance. To reduce the problem, WHO developed "ACCESS", "WATCH" and "RESERVE" (AWaRe) classification of antibiotics that promotes antimicrobial stewardship.[13] The "Be Antibiotic Aware" campaign was also developed by the Centre for Disease control and Prevention to educate health care professionals, patients and families to use antibiotics judiciously to help limit the development of antibiotic resistance. Data have shown that up to 50% of the antibiotics prescribed are potentially unnecessary or not optimally effective.[14] The present study assessed antibiotic prescribing pattern of the surgical in-patients. The prescribing pattern when analysed among the patients consisted of 218 Males (41.5%) and 307 Females (58.5%) mainly of 117 patients in the age group of 31-40 years (22.3%). This finding is almost similar to a recently conducted study.[13]

The most common diagnosis which was encountered in this study was Acute Cholecystitis (118,22.5%). Other cases were fractures (82,15.6%), LSCS (72,13.7%), renal colic (52, 9.9%), fibroid (50,9.5%), etc. Such observations were also seen by other investigators.[14,15]

The maximum number of antibiotics used by the department of surgery and orthopaedics during the study period was 267 (50.9%) and 82 (15.6%) respectively. These findings were more or less conformed to previous studies.[15] The use of multiple antibiotics was 255 (48.6%) with the parenteral route I/V being 483 (92%) followed by oral route with 42 (8%).[16,17]

The most common antibiotic prescribed by the clinicians was Ceftriaxone alone (34.4%) as in the WATCH group. Ceftriaxone+Tazobactam (8.9%) and Ceftriaxone +Sulbactam (4.34%) comprised both from ACCESS group. These were the notable findings supported by reports in other findings.[13,17,18]

On further analysis of the prescribing pattern, the major prescribed antibiotics belonged to the ACCESS group (59.28%) which has also been observed in previous studies.[13,16,19]

Likewise, 40.19% of the prescribed antibiotics belonged to the WATCH group. The solitary antibiotic Linezolid from the RESERVE group contributed with 0.53% for specific indication. Over and above, the prescribers select the antibiotic for empirical treatment with their personal clinical experience. Such type of prescriptions may lead to antimicrobial resistance. Therefore, there should be strict adherence to guidelines for definitive treatment with any antibiotic.

LIMITATION

The finding of the present study is only the tip of the iceberg of the prescribing pattern of any type of prescriptions by the prescribers (surgeon, physician, etc).

CONCLUSION

Studies on improving physician guideline may not be generalised since the barriers in one setting may not be present in another. Differential diagnosis for as to spill out why physicians do not follow guidelines and WHO approach towards improving prescription pattern needs utmost attention. This will minimise antimicrobial resistance and set a framework for future research.

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