



EVALUATION OF ANTIBIOTICS USAGE BY WORLD HEALTH ORGANIZATION (WHO) ACCESS, WATCH, RESERVE (AWaRe) INDEX IN SURGERY WARD AT A TERTIARY CARE TEACHING HOSPITAL

Pharmacology

Dr. Jinal M. Modh Resident Doctor, Department of Pharmacology, PDU Govt. Medical College, Rajkot.

Dr. Amita R Kubavat* Assistant Professor, Department of Pharmacology, PDU Govt. Medical College, Rajkot.
*Corresponding Author

ABSTRACT

Background: Antibiotics are one of the most common medicines prescribed in hospitals. Excessive exposure to antibiotics results in the Antibiotics resistance (AMR). To reduce antimicrobial resistance, World Health Organization (WHO) has developed the Access, Watch, Reserve (AWaRe) classification of antibiotics. **Methods:** A cross sectional, observational study was conducted in the Department of surgery, Tertiary Hospital, Rajkot, Gujarat. over a period of two months. Total 250 patients were enrolled in this study from surgery ward. **Results:** Total 250 prescriptions were analysed during study period. Out of them, there were 66% Males and 34% Females. Total Fifteen antibiotics were used. The most commonly prescribed antibiotic was Ceftriaxone. A total of 451 antibiotics was prescribed for a total of 250 patients with an average of 1.8 antibiotics per prescription. Watch group of antibiotics were more used. **Conclusion:** The study reveals that watch group antibiotics are used more frequently among the three groups.

KEYWORDS

Evaluation, Antibiotics, Surgery, WHO AWaRe

INTRODUCTION:

Antibiotics are one of the most common medicines prescribed in hospitals. Excessive exposure to antibiotics results in the Antibiotics resistance (AMR). In 2017 World Health Organization (WHO) has updated the Essential Medicine List (EML) and categorized the antibiotics into three groups- Access, Watch and Reserve (AWaRe), to optimize the use of antimicrobials.¹

According to AWaRe classification 2021, Access group includes 87 antibiotics (e.g. β -lactam, aminoglycoside, and first-generation cephalosporin antibiotics) are considered safe to use and hence should be freely available as first-line drugs.³ access group antibiotics have activity against a wide range of commonly encountered susceptible pathogens & lower resistance potential than antibiotics in the other groups.

Watch group includes 141 antibiotics (e.g. macrolides, quinolones, penems, second and third-generation cephalosporins) recommended only for specific, limited indications & recommended as essential first or second choice empiric treatment options for a limited number of specific infectious syndromes. Reserve group includes 29 antibiotics (e.g. fifth-generation cephalosporins, polymyxins, Oxazolidinones) that should be reserved for treatment of confirmed or suspected infections due to multi-drug-resistant organisms, should be treated as "last resort" options.²

Antimicrobials that are included in the WHO Model List of Essential Medicines but have not yet been categorized under AWaRe classification, who not recommend their use in clinical practice.² An AWaRe index, a novel metric for stewardship, could be introduced to help estimate the relative use of narrow-spectrum and broad-spectrum antibiotics.¹

MATERIALS AND METHODS:

A cross sectional, observational study was conducted in the Department of surgery, Tertiary Hospital, Rajkot, Gujarat. The study was done after obtaining approval from the Institutional Ethics Committee. The data were collected in between April 2022 to June 2022. Total 250 patients were enrolled in this study. This study was conducted after obtaining written informed consent from patients. In case of paediatric patients written informed consent obtained from parents of patients. The data was entered into excel sheet. Data analysis was done by using the percentages.

Selection criteria:

Inclusion criteria:

Patients of either sex, admitted in surgery ward & prescribed with systemic antibiotics during the study period.

Exclusion criteria:

Patients who prescribed with antitubercular, antifungal, anthelmintic,

antiviral drugs, and topically applied antimicrobials were not included.

RESULTS:

Total 250 patients were analysed during study period. Out of them, there were 165 (66%) Males and 85 (34%) Females. [Table 1] Most of the patients were in the age group of 15 to 29 years with the mean age distribution of 41.05 years and age range from 4 month to 90 years. [Figure 1] Throughout the study period, from a total of Fifteen antibiotics prescribed, seven were in the "access" category, seven in the "watch" category and one in the "reserve" category. The most commonly prescribed antibiotic was Ceftriaxone (70.8%) followed by gentamycin (41.2%), and metronidazole (28%). [Table 2] A total of 451 antibiotics was prescribed for a total of 250 patients with an average of 1.8 antibiotics per prescription. Watch group antibiotics (52.3%) were more used compared to access group (47.5%) according to WHO AWaRe index tool. [Figure 2]. two antibiotic (43%) per prescription was found to be prescribed more. [Table 2]

Table 1: Distribution of the patients according to gender

Gender	No. Of Patients (%)
Male	165 (66)
Female	85 (34)
Total	250 (100)

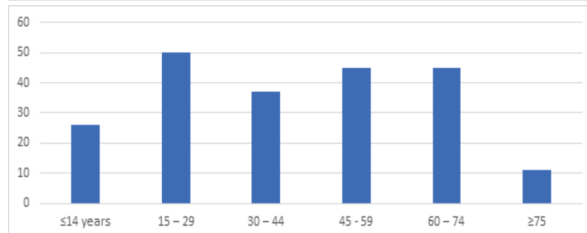


Figure 1: Age group wise distribution of patients

Table 2: Categorisation of antibiotics according to AWaRe index by the WHO

S. No.	Name Of Antibiotics	Class Of Antibiotic	Access Category	No. of patients (%)
1	Gentamycin	Aminoglycoside	Access	103 (41.2)
2	Metronidazole	Imidazole	Access	70 (28)
3	Amikacin	Aminoglycoside	Access	20 (8)
4	Augmentin	Beta Lactam	Access	17 (6.8)
5	Clindamycin	Lincosamides	Access	02 (0.8)
6	Amoxicillin/Clavulanic Acid	Beta Lactam	Access	01 (0.4)
7	Doxycycline	Tetracycline	Access	01 (0.5)
8	Ceftriaxone	3rd Generation Cephalosporin	Watch	177 (70.8)

9	Piptaz	Beta Lactam	Watch	29 (11.6)
10	Ciprofloxacin	Fluroquinolone	Watch	12 (4.8)
11	Cefixime Oral	3rd Generation Cephalosporin	Watch	07 (2.8)
12	Cefotaxime	3rd Generation Cephalosporin	Watch	06 (2.4)
13	Meropenem	Carbapenems	Watch	03 (1.2)
14	Levofloxacin	Fluroquinolones	Watch	02 (0.8)
15	Linezolid	Oxazolidinones	Reserve	01 (0.4)

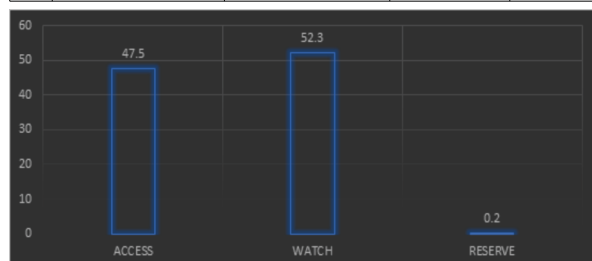


Figure 2: Antibiotics usage according WHO AWaRe index tool

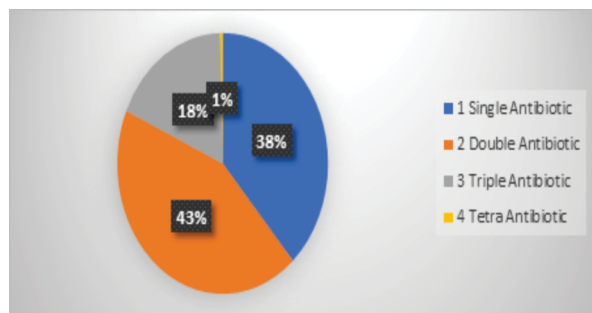


Figure 3: Number of antibiotics per prescription:

DISCUSSION:

India is among the largest consumers of antibiotics worldwide.⁴ In surgical indoor patients' antibiotics are most commonly prescribed. Inappropriate or irrational use of antibiotics result in the emergence and spread of drug-resistant bacteria are major risk factor for developing antibiotic resistance. Antimicrobial resistance (AMR) is a serious threat in public health and causing unfavourable effects like clinical (death or treatment failure) or economic (care cost and stay period).⁵ To assist in the development of tools for antibiotic stewardship at local, national and global levels and to reduce antimicrobial resistance, the Access, Watch, Reserve (AWaRe) classification of antibiotics was developed by WHO.²

The present study was done to evaluate antibiotics usage in surgery ward patients using WHO AWaRe index. It plays a key role in establishing the rationale for the use of antibiotics. In our study, total 250 admitted patients in surgery ward were included. The average age of the patients was 41.05 years, in the study done by Prasath KH et al. average age of the patients was 59 years.⁶ In our study male patients were more compared to female patients while in the study done by Siavash Shahbazi Nia et al. female patients were more compared to male patients.⁷

According to WHO AWaRe policy, the proportion of Access antibiotics should be greater than 60% of total antibiotic use.⁸ However, in our study, 47.5% antibiotics were prescribed from the Access group, in the study done by Thomas et al. 36% and in the study done by Bansal A et al. 41.21% antibiotics were prescribed from the Access group. In our study 52.30% antibiotics were prescribed from the Watch group, in the study done by Thomas et al. 53% and in the study done by Bansal A et al. 46.94% of antibiotics were prescribed from the Watch group. In our study 0.2% antibiotics were prescribed from reserve group, which was lower in compared to study done by Thomas et al. 9% and study done by Bansal A et al. 8.15% antibiotics were prescribed from reserve group.^{9,11}

In our study the antibiotic usage shows cephalosporin as the preferred antimicrobial, with third generation cephalosporins - Ceftriaxone being more commonly prescribed. similarly in other Indian studies done by Prasath KH et al., Soman N et al. and Sane RM et al.

Ceftriaxone being more commonly prescribed.^{6,12,13} In our study average 1.8 antibiotics were prescribed per prescription, while study done by Prasath KH et al. average 2 antibiotics were prescribed per prescription.⁶ In our study, 38% patients received one antibiotic per prescription While studies done by Patel SR et al. & Prasath et al. 55% patients received one antibiotic per prescription.^{14,6}

The current situation in India shows that there is excess use and availability of Watch group of antibiotics compared to Access group of antibiotics. As per WHO AWaRe policy the proportion of Access antibiotics should be >60% of overall antibiotic use that will become a common global target to reduce antimicrobial resistance by favouring the use of Access narrow spectrum antibiotics in comparison to Watch and Reserve antibiotics.⁸

CONCLUSION:

The study reveals that watch group antibiotics are used more frequently.

REFERENCES:

- Sharland M, Pulcini C, Harbarth S, Zeng M, Gandra S, Mathur S, Magrini N. Classifying antimicrobials in the WHO Essential Medicines List for optimal use-be AWaRe. *Lancet Infect Dis* 2018; 18:18-20.
- World Health Organization. Aware Portal. Health Organization; 2021. (WHO/ HPS/EML/2021.04). Licence: CC BY-NC-SA 3.0 IGO. Available from: <https://www.who.int/publications-detail-redirect/2021-aware-classification>
- Bansal A, Sharma R, Prakash R. Adoption of the World Health Organization access, watch reserve index to evaluate and monitor the use of antibiotics at a tertiary care hospital in India. *Perspect Clin Res* 2022; 13:90-3.
- Klein Eili Y, Milkowska-Shibata Maja, Tseng Katie K, et al. Assessment of WHO antibiotic consumption and access targets in 76 countries, 2000-15: an analysis of pharmaceutical sales data. *Lancet Infect Dis*. 2020;21(1):107-115.
- Goyal PK, Semwal A, Prakash A, Medhi B. Emerging antimicrobial resistance and newer tools to address the resistance. *Indian J Pharmacol* 2019; 51:291-5.
- Prasath KH, Sneha VV, Prashanth ES et al. Drug Utilization Evaluation on Antibiotics in ICU by Using WHO Indicators – A Prospective observational Study. *IOSR-JPBS*, 2020;15(5):54-66.
- Shahbazi Nia S, Hiremath SRR, Prasad S. Assessment of Antimicrobial Use Pattern Using World Health Organization Prescribing Indicators at a Tertiary Hospital: A Prospective, Observational study. *J App Pharm Sci*, 2018; 8(06): 132-138.
- World Health Organization. AWaRe policy brief [Available from: https://adoptaware.org/assets/pdf/aware_policy_brief.pdf]; 2019.
- Thomas AP, Kumar M, Johnson R et al. Evaluation of antibiotic consumption and compliance to hospital antibiotic policy in the surgery, orthopaedics and gynaecology wards of a tertiary care hospital. *Clinical Epidemiology and Global Health*, 2022;13:1-5.
- Melaku T, Gashaw M, Chelkeba L et al. Evaluation of Adult Outpatient Antibiotics Use at Jimma Medical Center (with Defined Daily Doses for Usage Metrics). *Infection and Drug Resistance*, 2021;14: 1649-1658.
- Bansal A, Sharma R, Prakash R. Adoption of the World Health Organization access, watch reserve index to evaluate and monitor the use of antibiotics at a tertiary care hospital in India. *Perspect Clin Res* 2022;13: 90-3.
- Soman N, Panda BK, Banerjee JK, John SM. A study on prescribing pattern of cephalosporins utilization and its compliance towards the hospital antibiotic policy in surgery ward of a tertiary care teaching hospital in India. *Int Surg J*. 2019;6(10): 3614.
- Sane RM, Shahani SR, Kalyanshetti AA. Antibiotic prescription pattern in surgical wards of MGM hospital. *Kamotho. Int J Infect*. 2018;5(1), e57914.
- Patel SR, Shah AM, Shah RB, Buch JG. Evaluation of drug utilization pattern of antimicrobials using ATC/DDD system in intensive care unit of a tertiary-care teaching hospital. *Int J Med Sci Public Health* 2016; 5 :80-84
- Gandra S, Kotwani A. Need to improve availability of 'access' group antibiotics and reduce the use of 'watch' group antibiotics in India for optimum use of antibiotics to contain antimicrobial resistance. *J Pharm Policy Pract*. 2019;12(1):20-23.
- WHO. Global action plan on antimicrobial resistance. 2015.http://apps.who.int/iris/bitstream/10665/193736/1/9789241509763_eng.pdf (accessed Dec 5, 2017)