

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

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Abstract

Background: The World Health Organization classification of antibiotics classifies key antibiotics into access, watch, and reserve (AWaRe) categories. Categorization provides a novel metrics called “AWaRe index” to study and monitor antibiotic consumption globally and within the same setting over time.

Aim: The aim of this study is to compare the use of antibiotics in 2 years using the AWaRe index tool.

Materials and Methods: A retrospective study was conducted in SMS Hospital, Jaipur to collect data regarding total antibiotics consumed between January 2017 and December 2018 from drug distribution centers in hospital premises using the AWaRe classification. Data were then compared on yearly basis.

Results: In 2017, 53.31% of antibiotics consumed belonged to access, 40.09% to watch, and 3.40% to reserve category, respectively, as compared to 41.21%, 46.94%, and 8.15%, respectively, in 2018.

Conclusion: Increased use of watch (17%) and reserve antibiotics (140%) over 1 year with the same infection scenario in a similar setting indicates resistance in evolution.

Keywords: Access, antibiotics, reserve, watch

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INTRODUCTION

The World Health Organization (WHO) classifies key antimicrobials into access watch and reserve categories on the basis of their safety, spectrum, and propensity to develop resistance. Access antimicrobials are considered safe to use and hence should be freely available as first-line drugs watch, and reserve antimicrobials require monitoring and are the main targets of the antimicrobial surveillance program. Traffic light color codes are suggested to indicate the different categories: access (green), watch (amber), and reserve antibiotics (red).

According to AWaRe classification 2019, access group includes 48 (19 in EML), watch group includes 110 antimicrobials (11 in EML), and reserve group has 22 (7 in EML) antimicrobials in it. Antimicrobials that are included in the WHO Model List of Essential Medicines but have not yet been categorized under AWaRe classification are reported as “Other ” or ”unclassified.” Besides them, fixed-dose combinations whose use is not endorsed by the WHO has now been placed in a separate group called “Not Supported by the EML.”

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It is to be noted here that the drugs from one class such as aminoglycosides and tetracyclines, maybe spread over more than one category and can be re-categorized depending on local antimicrobial stewardship policy.^[1-3]

AWaRe classification also provides a novel metric called the AWaRe index tool. Previously also many antimicrobial consumption indices have been developed such as daily defined dose, Amoxicillin index, Access to watch ratio, Watch percentage, DU 75, and Access percentage.^[2,4,5] However now, the WHO has established a network called WHO Network to collect antibiotic consumption data from member states using AWaRe classification. India is also collecting and submitting its data into it by national program called National Antimicrobial Consumption Network (NAC-NET). WHO will then compare the qualitative pattern of antimicrobial consumption worldwide using AWaRe classification for drug resistance and will use it in policy decision for optimum use of antimicrobials in future. Another importance of AWaRe index is that it can be used to identify local infection prevalent in a specific time responsible for increased use of watch and reserve antimicrobials during that particular time period provided availability of access antibiotics was not a restraint. 13th WHO general program of work also suggests that by the end of 2023, at least 60% of antibiotics use should be from the access group to prevent further development of resistance.^[6]

Aim and objectives

To compare the use of antibiotics in two years using the AWaRe index tool.

MATERIALS AND METHODS

This was a retrospective study conducted at SMS Hospital, Jaipur (Rajasthan), India, from January 2017 to December 2018. SMS hospital is one of the centers selected under NAC-NET program across India. In this study, month-wise data regarding all the antibiotics which were consumed in hospital in 2017 and 2018 were collected from the Drug Distribution Centres (DDCs) within the hospital premises through the personal visit to these DDCs. The advantage of this method over prescription auditing was that it covered all the patients prescribed with antibiotics in the hospital irrespective of the department. The hospital has free drug delivery scheme (also known as Mukyamantri Nishulk Dawa Yojna) where medicines under state EML are given free to the patients through DDCs. The antibiotics consumed were then categorized according to the AWaRe classification 2019 and compared on monthly and yearly basis. Antitubercular, antifungal, antihelminthic, antiviral

drugs, and topically applied antimicrobials were not included in the study as these are not incorporated in the list of WHO AWaRe classification of antibiotics.

RESULTS AND ANALYSIS

A total number of antibiotics consumed in 2017 were 3017706 and in 2018 were 3739413.

In 2017, out of total antimicrobials consumed, 53.31% belonged to access, 40.09% to watch, and 3.40% to reserve category, respectively. Rest 3.18 were either other (also known as unclassified) or not recommended. However, for 2018, access category antimicrobials accounted for 41.21% of consumption, followed by 46.94% and 8.15% for watch and reserve, respectively, with 3.66% as either unclassified or not recommended [Figure 1].

It means over one year only, the use of access antibiotics decreased by 23%, watch category antibiotics increased by 17%. In contrast, the use of reserve antibiotics increased by whopping 140% though it still remained below 10% of total drug consumption.

Our study also finds that reserve antimicrobials were maximum used in the month of July in both years. Similarly watch antimicrobials were used maximum in November 2017 and September 2018.

Relative use of antimicrobials in 2017 and 2018 depicts that narrow spectrum penicillins were the most commonly used antimicrobials in 2017 where as in 2018 cephalosporins were most frequently used [Table 1].

DISCUSSION

Our study shows that antimicrobials used were 53.31%,

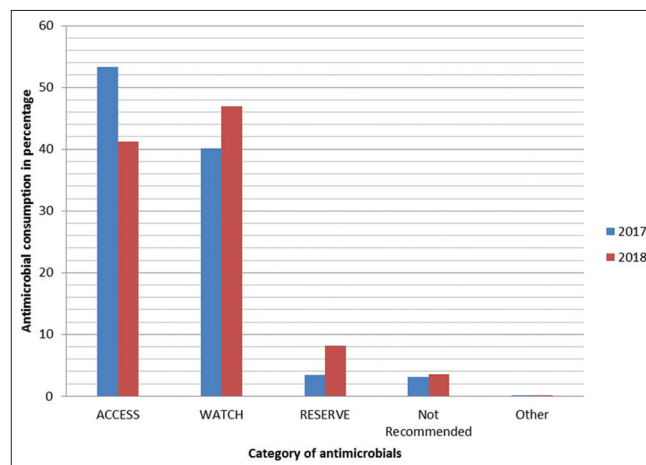


Figure 1: Comparison of antimicrobial consumption in 2017 versus 2018 using AWaRe classification (A=Access, Wa=Watch, Re= Reserve)

Table 1: Relative antimicrobial consumption in year 2017 and 2018

Drug	Category	Antibiotic consumption in number 2017	Antibiotic consumption in Percentage 2017	Antibiotic consumption in number 2018	Antibiotic consumption in Percentage 2018
Amikacin	Access	137,921	4.57	338,130	9.04
Amoxicillin	Access	-	-	2700	0.07
Amoxicillin-clavulanic acid	Access	1,211,754	40.15	942,243	25.19
Doxycycline	Access	53,473	1.77	50,820	1.35
Metronidazole	Access	205,832	6.82	206,773	5.53
Azithromycin	Watch	168,506	5.58	166,784	4.46
Cefixime	Watch	-	-	546,625	14.62
Cefotaxime	Watch	13,695	0.45	12,548	0.33
Ceftazidime	Watch	898,88	2.97	66,563	1.78
Ceftriaxone	Watch	490,389	16.25	466,894	12.48
Cefuroxime	Watch	-	-	129,850	3.47
Ciprofloxacin	Watch	134,970	4.47	127,965	3.42
Meropenem	Watch	119,641	3.96	124,636	3.33
Norfloxacin	Watch	18,675	0.61	30,239	0.80
Ofloxacin	Watch	162,927	5.39	67,447	1.80
Vancomycin	Watch	11,237	0.37	16,911	0.45
Linezolid	Reserve	102,672	3.40	304,950	8.15
Cefoparazone+sulbactam	Not recommended	29,122	0.96	38,994	1.04
Oflox-OZ	Not recommended	64,004	2.12	94,614	2.53
Tinidazole	Other	3000	0.09	3727	0.09
Total		3,017,706	99.93 (approx. 100)	3,739,413	99.93 (approx. 100)

40.09%, and 3.40% from access, watch, and reserve (AWaRe) group respectively in the year 2017. However, 41.21%, 46.94%, and 8.15% were consumed from AWaRe groups respectively in the year 2018. A similar study done in England says, overall, more antimicrobials were used from the access group (68.7%) followed by watch (18.4%), reserve (0.4%), and other (12.4%) there as per the WHO AWaRE index. Nevertheless, these results in England primarily reflect antimicrobials dispensed in community or primary health-care settings, where more than 80% of prescribing occurs. While our study was done at tertiary hospitals only where more complicated cases come and hence more chances of prescribing broad-spectrum antimicrobials. In the acute hospital sector, there also, unsurprisingly, more watch and reserve antimicrobials were used in 2016 viz. access antimicrobials (49.7%), followed by watch (46.9%), reserve (3.3%) and other (0.1%). In addition, between 2011 and 2016, hospital prescribing within the access category decreased by 4%, the watch category increased by 3%, and the reserve category increased by 28% though still remained, 3% of total prescribing.^[7] These reports are in full concordance with the trend of antimicrobial use pattern in our study, which was done in tertiary care center where we also find a decrease in access antimicrobial use and increase in the use of watch and reserve antimicrobials over 1 year. However, we could not compare the above findings in Indian backdrop as we were unable to find any similar study using the AWaRe index from India till date, which compares antimicrobial use over the years.

Another study pertaining to the analysis of one-day point prevalence survey of antimicrobial prescription data of 23,572 patients included from 56 countries was done by Hsia *et al.* The analysis data again highlighted the high diversity in the patterns of AWaRe antimicrobial use among these 56 studied countries where access antimicrobial use in children ranged from 7.8% (China) to 61.2% (Slovenia) of all antimicrobial prescriptions. The same study shows that in India, >50% antimicrobials were used from watch groups against only 38% from the access group in lower respiratory tract infections in children.^[8] A similar study by McGettigan *et al.* also mention the widespread use of watch antimicrobials (57%) in 2011–2012 in India.^[9] Different studies to find point prevalence of antimicrobial use in hospitalized children and outpatients in India report 61.5% of children were on at least one antimicrobial agent, with excessive use of third-generation cephalosporins (watch group) with a similar pattern of antimicrobial use in adults.^[10,11] As per our study, highest rate of antimicrobial consumption was in month of July. Similar study done in India also says peak prescribing rates during pre-monsoon and monsoon season, i.e., June–July.^[12]

Many reasons have been given for overprescribing of broad-spectrum antimicrobials such as fear of the risk of treatment failure, poor regulation, over the counter availability of antimicrobials, influence of peers and senior colleagues, together with patient demands and expectations.^[13-15] Since March 2014, the National Action plan of India has incorporated a separate Schedule H-1 in Drug and Cosmetic rules to regulate the sale of

antimicrobials in the country.^[14] Still more measures need to be adopted to monitor and optimize all antibiotic consumption to prevent the development of drug resistance and hence preserve the effectiveness of last-resort antibiotics.

CONCLUSION

Comparative qualitative analysis of antibiotics consumed in 2 years by using the WHO AWaRe index tool in our study finds that the consumption of watch and reserve antibiotics and hence antibiotic resistance is increasing.

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Conflicts of interest

There are no conflicts of interest.

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