Antibiotic-prescribing pattern in the Paediatric outpatient department using the WHO prescribing indicators and AWaRe assessment tool in a tertiary-care hospital in Central India – A Retrospecive Study.

[1]Dr. Vandana Badar, Professor and Head Dept. of Pharmacology I.G.G.M.C., Nagpur.

[2]Dr. Sriramagiri Sai Vinay, Junior resident I.G.G.M.C., Nagpur.

[3]Dr. Arjun Bathia, Junior resident I.G.G.M.C., Nagpur.

[4]Dr. Rahulkumar K Kodape, Junior resident I.G.G.M.C., Nagpur.

Corresponding Author: Dr. Vandana Badar, Professor and Head Dept. of Pharmacology I.G.G.M.C., Nagpur.

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Abstract

Background: Pediatrics pertains to the medical field that focuses on providing healthcare services for individuals who are in the developmental stage of infancy, childhood, and adolescence and are under the age of 18. Antibiotics are frequently prescribed to pediatric patients for the management of various illnesses such as fever, urinary tract infections, gastro enteritis, respiratory tract infections. Child is not a miniature adult so principles of adult medicine cannot be directly adapted to children and drug dosages are specific and not a mathematical derivation of adult medicine so there is need to regularly audit the prescriptions to regulate and create uniform prescription pattern.

Material and methods: this is a retrospective observational non-interventional study conducted among the patients attending pediatrics outpatient department dated 01/11/2021 to 30/4/2022 in a tertiary care teaching hospital in central India with the permission of IEC. the study will be conducted on analyzing prescriptions of patients attending Pediatrics OPD collected from efficient data base in a tertiary care hospital in central India.

Results: Out of 793 prescriptions analysed, 404 (51%) were male and 389 (49%) were female. Age wise distribution was done 1-month to 1-year- 26 (3.3%), 1-5 years- 464 (58.5%),5- 15 years-303 (38%). Total number of antibiotics prescribed per prescription were 01 anti-microbial- 785 prescriptions (99%), 02 anti-microbials – 8 prescriptions (1%), More than 2 – 0 prescriptions.

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Amoxicillin-clavulanic acid 377(47.5%) is the most common antibiotic prescribed followed by albendazole 279(35%), cefixime 68(8.6%) and others. Access group of antibiotics were most commonly prescribed

Conclusion: The drug prescription pattern observed in the study was found majorly to be the rationale, generic, and hence less chances of antimicrobial resistance. Polypharmacy was observed

Keywords: Drug utilization studies, AWaRe classi fication, rational prescription.

Introduction

Paediatrics is a branch of medicine that provides health care to children younger than 18 years of age. In India, 30% of the population is in this age group and are more susceptible to infections due to their developing immune systems. Antibiotics are commonly prescribed to treat various paediatric illnesses. (1)

To combat antibiotic resistance and ensure safe and effective medication use, it is essential to implement strict antibiotic policies and promote rational drug use. This can help reduce healthcare costs and improve patient outcomes. (2)

In 2019, the World Health Organization (WHO) launched the AWaRe classification database, which classifies 180 different types of antibiotics into three groups: access, watch, and reserve. This database is designed to help promote the optimal and appropriate use of antibiotics.

Therefore, the AWaRe classification database is an essential tool in ensuring the responsible use of antibiotics and preserving their effectiveness for future generations. (3)

Child is not a miniature adult so principles of adult medicine cannot be directly adapted to children and drug dosages are specific and not a mathematical derivation

of adult medicine (1)(4), so there is need to regularly audit the prescriptions of paediatric patients to regulate and create uniform pre scription pattern. Material and Methods: Study design: this is a retrospective observational non-interventional study conducted among the patients attending pediatrics outpatient department dated 01/11/2021 to 30/4/2022 in a tertiary care teaching hospital in central India done with the permission of IEC Study duration: 6 months Place of work / source of data: the study will be conducted on analyzing prescriptions of patients attending Pediatrics OPD collected from efficient data base in a tertiary care hospital in central India.

Study population

Sample size

793 patients prescribed with anti-microbial out of a total 3512 patients registered in Pediatrics OPD were analyzed in the current study.

Inclusion Criteria

Patients of age 1month-15years, pediatrics outpatient department III. Exclusion Criteria: patients above 16yrs, Neonates, IPD patients, prescriptions without anti-microbials, incomplete prescriptions.

Data analysis

Results evaluated with MS Excel and presented as percentages The prescriptions were analysed for the following prescribing indicators of drug use

1. Average number of medicines per encounter

2. Percentage of prescriptions with a generic name

3. Percentage of medicines prescribed from essential medicines list (EML)

4. AWaRe Classification of antibiotics

Results

Table 1: Demographic profile of the paediatric patients. N= 793

Table 1 Demographic profile

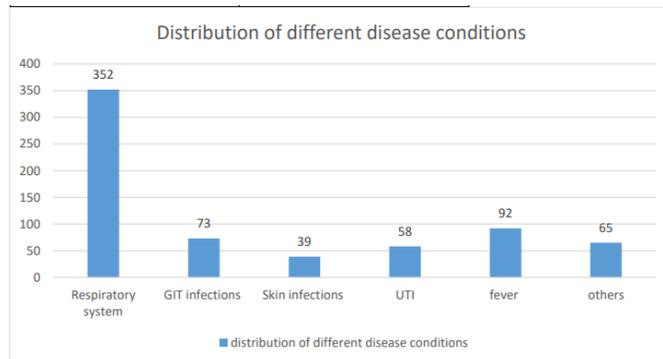| Age	n (%)
1-month to 1-year	26 (3.3%)
1-5 year	464 (58.5%)
5-12 year	303 (38%)
Sex	
Male child	404 (51%)
Female child	389 (49%)

Distribution of different disease conditions

Figure 1: Distribution of disease conditions

Table 2: Number of antimicrobials prescribed to paediatrics patients.

Number of microbial/ patient	Number of prescriptions (%)	Total no of microbial prescribed
01	785 (99%)	785
02	8 (1%)	16
More than 2	0	

Table 2 Antimicrobials prescribed per prescription

Table 3: WHO prescribing Indicators

Indicators of drug use	Present Study	WHO optimal values(5)	Babu LN et al(6)	Nalini et al (2)
Average number of medicines per encounter	2.1	1.6-1.8	2.74	3-7
Percentage of antimicrobials with generic name	98%	100%	83.13	30.9
Percentage of antimicrobials prescribed from EML	100	100%	87.9	90%
Number of encounters with an injection prescribed	0	13.4%-24.1%	0.16	58.25%
Percentage of encounters with one or more antibiotics	14.8%	20%-26.8%	20.33%	3.5 antibiotics per prescription

Table 3 WHO Prescribing Indicators

Table 4: Type of antimicrobials prescribed

Antimicrobials group	Names	No. of prescriptions
Cephalosporins	Cefixime	68 (8.6%)
Penicillins	Amoxicillin	29 (3.7%)
	Amoxicillin-clavulanic acid	377 (47.5%)
Fluoroquinolones	Ciprofloxacin	8 (1%)
	Ofloxacin	1 (0.1%)
Macrolides	Azithromycin	12 (1.5%)
Niroimidazole	Metronidazole	18 (2%)
Cotrimoxazole		9 (1%)
Benzimidazole	Albendazole	279 (35%)

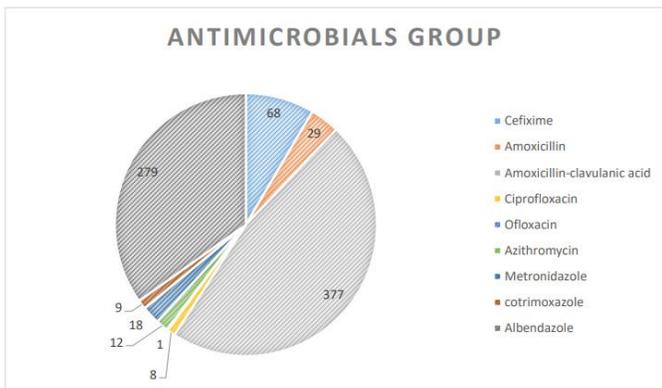Table 4 type of antimicrobials prescribed

Figure 2: Antimicrobials

Table 5: Classification of the most commonly prescribed antibiotics as per WHO AWaRe classification

Antibiotics	AWaRe classification
Cefixime	Watch
Amoxicillin	Access
Amoxicillin-clavulanic acid	Access
Ciprofloxacin	Watch
Ofloxacin	Watch
Azithromycin	Watch
Metronidazole	Access
cotrimoxazole	Access

Table 5 AWaRe Classification

Table 6: Comparsion of AWaRe Classification

AWaRe	Present study	Mudenda et al(7)
Access	83%	55.5
Watch	17%	43.1
Reserve	0	1.4

Table 6 compasrsion of AWaRe classification

Table 7: comparsion of different parameters

	Present study	Parekar SM et al (8)	Ahmed MM et al(9)	Bamel VV et al(10)	Nalini et al.
Male : Female ratio	51:49	54.7: 46.3	59:41	54:46	47:53
Highest % age group	1-5 years (58.5%)	Infant (55.6%)	6mon to3yrs (41%)	Median age : 6years	0-5 years (74%)
Most common system involved	Respiratory system > fever	Respiratory	Respiratory	Respiratoty system > GIT	Respiratoy
Most common group of antibiotics prescribed	Penicillin > cephalosporin	Penicillin> cephalosporin	Cephalosporin > penicillin	cephalosporin	Cephalosporin
Most common antimicrobial prescribed	Amoxicillin – clavulanic acid > albendazole	Amoxicillin – clavulanic acid	Amoxicillin – clavulanic acid	Ceftriaxone > amoxicillin-clavulanic acid	Ceftriaxone

Table 7 Comparsion of different parameters

Discussion

Drug utilization studies are important for understanding drug usage patterns, identifying potential problems, evaluating effectiveness and costs, addressing dis parities, and improving prescribing and administ ration practices In our study, 793 prescriptions from paediatric OPD are included after careful analysing the data for a duration of six months duration from November 2021 to April 2022. Children aged 1-5 years 464 (58.5%) visited OPD were the most followed by children aged 6-14years 303 (38%)) which is similar to El-Dahiyat et al (11) but contrast to Parekar SM et al (8) and other similar studies infants 1month to 1 year were the most common age group and. In present study, male patients (51%) were more as compared to female patients (49%) which is line with other studies but the gender gap was less compared to them like 2 Sodhi et al (63:37) (12) and Sankhla S et al (61.24 :38.76) (13). High antimicrobial was prescribed for respiratory system which is similar to others (8) (10). majority of anti-microbials prescribed were oral formulations (98%). Antimicrobial FDCs used were amoxicillin clavulanic acid and cotrimoxazole which were included in NLEM 2022 (14).

Conclusion

This study gives an overview of the pattern of antibiotic use in the study area by age and sex distribution, frequency and percentage of single as well as combined drugs prescriptions. Antibiotic prescriptions that include medications from the National List of Essential Medicines (NLEM) and generic drugs hold potential promise, as they can improve the accessibility and afford ability of antibiotics for patients(15). Prescriptions with more than one antimicrobial are very few so it is a good sign. In conclusion, the AWaRe classification system is a valuable tool that can help healthcare professionals make informed decisions about antibiotic use, based on the antibiotics' importance and effective ness. By using this system, healthcare providers can ensure that anti biotics are prescribed appropriately, reducing the risk of anti-microbial resistance and promoting safe and effective treatment for patients.

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References

1. OP. G. Essential pediatrics. 9th ed. New Delhi CBS Publishers and distributors Pvt. Ltd.; 2010. p. 1. Essent Pediatr 9th Ed. 2010;1.

2. Nalini G. K., Neelamma*, Prasanna Kumar D. G., Deepak P. SGN, Jayashree G. N. BKAV. Prescribing pattern of antibiotics in pediatric department of a tertiary care teaching hospital. Int J Basic Clin Pharmacol. 2020; 9(5):782–5.

3. R. P. Priyadharsini, Kesavan Ramasamy SA. Anti biotic- prescribing pattern in the outpatient departments using the WHO prescribing indicators and AWaRe assessment tool in a tertiary- care hospital in South India. J Fam Med Prim Care [Internet]. 2022; 11 (1): 74–8. Available from: http://www.jfmpc.com/ article. asp? issn= 2249- 4863; year=2017; volume=6; issue=1; spage=169; epage=170; au last=Faizi

4. Mathew R, Sayyed H, Behera S, Maleki K, Pawar S. Evaluation of antibiotic prescribing pattern in pediatrics in a tertiary care hospital. 2021;15–9.

5. WHO. Introduction to Drug Utilization Research World Health Organization. Solutions. 2003. 17–18 p.

6. Babu L. N., Maharani B.*, Lourdu Jafrin A., Priya darshini P., Monisha P. SG. Outpatient prescription audit

in a tertiary care hospital at Puducherry. ijbcp. 2019; 8 (12):2655–60.

7. Mudenda S, Nsofu E, Chisha P, Daka V, Chabalenge B, Mufwambi W, et al. Prescribing Patterns of Anti biotics According to the WHO AWaRe Classifi cation during the COVID-19 Pandemic at a Teaching Hospital in Lusaka, Zambia: Implications for Streng thening of Anti-microbial Stewardship Pro grammes. Pharma coepidemiology. 2023;2(1):42–53.

8. Parekar SM, Maindarkar GK, Maindarkar V V. Drug utilization pattern in outdoor patients of pediatric tertiary care hospital: a cross sectional study. Int J Basic Clin Pharmacol. 2020;9(11):1725.

9. Ahmed MM, Mujeeb MMA. A prospective study of antimicrobial drug utilization in infective diseases in pediatrics at Navodaya Medical College Hospital of Raichur, Karnataka, India. Int J Basic Clin Pharmacol. 2018;7(8):1498.

10. Bamel VV, Shahani SR, Mohanty NC. Study of drug utilization and antimicrobial prescription pattern of indoor paediatrics cases in tertiary care hospital. Int J Basic Clin Pharmacol. 2017;7(1):98.

11. El-Dahiyat F, Salah D, Alomari M, Elrefae A, Jairoun AA. Antibiotic Prescribing Patterns for Outpatient Pediatrics at a Private Hospital in Abu Dhabi: A Clinical Audit Study. Antibiotics. 2022;11(12):1–12.

12. Sodhi B, Basu S. Antibiotic Prescription Audits Among Pediatric Outpatients With Acute Ailments in a Secondary Care Hospital During the COVID-19 Omicron Wave in Northern India. 2022;14(11):0–6.

13. Sankhla S, Gaur S. A retrospective study of drug utilization pattern in the outpatient department of pediatrics in a tertiary care teaching hospital of Rajasthan, India. Int J Basic Clin Pharmacol. 2016; 5(5): 2025–31.

14. NLEM. National List of Essential Medicines. 2558;

15. Mishra R. Prescription pattern of antimicrobial drugs in pediatrics outpatient department of a tertiary care teaching hospital of North India. Int J Basic Clin Pharmacol. 2014;3(2):1.