

Original Research Article

Antibiotic prescribing practice in a Paediatric Outpatient Clinic in Owerri, Imo state, Nigeria.

Abstract.

Background.

Antibiotics are amongst the most frequently prescribed drugs for children in outpatient clinics but irrational prescribing can cause medication errors, antibiotic resistance and treatment failure. Examples of irrational prescribing includes poly-pharmacy, over use of injections, inappropriate use of antimicrobials and failure to prescribe in accordance with treatment guidelines.

This study sought to assess antibiotic prescribing practice in the children's outpatient clinic of the Federal university teaching hospital Owerri, Imo state

Material/Methods.

This was a descriptive prospective study carried out in the Children's Outpatient Clinic (CHOP) of the Federal university teaching hospital Owerri, Imo state Nigeria between April and June 2021. During the study period, medical record of patients who attended the CHOP and who had antibiotic(s) prescribed were collated. Prescribing practice was assessed using the World Health Organization prescribing indicators.

Result.

A total of 495 antibiotic prescriptions were made for 478 patients. This gave 1.04 as the average number of medicines prescribed per patient encounter. 1.6% of the antibiotics were prescribed as injections and 79.2% of the prescriptions were in generic names. While only 96.8% of the

prescriptions were from the Nigerian essential drug list ,the three most prescribed antibiotics Amoxicillin/Clavulanic acid, Cefuroxime and Amoxicillin are all listed in it.

Conclusion.

The antibiotic prescribing practice in the children's outpatient clinic was rational with regards to average number of medications per patient encounter and percentage of encounters with injection prescribed. It was irrational in terms of percentage of antibiotics prescribed in generic names and percentage of antibiotics prescribed from the Nigerian essential drug list.

Key words. Antibiotics, Children , Outpatient clinic, Prescribing practice.

Introduction.

Antibiotics are amongst the most frequently prescribed drugs for children in outpatient clinics giving the increased risk of infection in this age group.¹⁻⁴ It is estimated that more than half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take them correctly. This irrational drug use results in wastage of scarce resources and widespread health hazards.⁵

The World Health Organization(WHO) defines rational use of medicines as patients receiving medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community.⁵

The problems that can result from irrational prescribing are myriad. They include but are not limited to increased cases of medication errors, antibiotic resistance and treatment failure.The commonest examples ofirrational prescribing are poly-pharmacy, over use of injections,

inappropriate use of antimicrobials and failure to prescribe in accordance with treatment guidelines.⁵

In 1990's, WHO in collaboration with the International Network of Rational Use of Drugs (INRUD) developed a set of indicators to measure the performance of healthcare facilities with regards to utilization of drugs⁶. These core drug use indicators are classified into prescribing, patient-care and facility-specific. The specific component that covers prescribing indicators and their optimal values are stated below;

Average number of medicines prescribed per patient encounter	1.6–1.8
Percent medicines prescribed by generic name	100%
Percent encounters with an antibiotic prescribed	20.0–26.8%
Percent encounters with an injection prescribed	13.4–24.1%
Percent medicines prescribed from essential medicines list or formulary	100%

Several studies have documented prescribing practices in diverse settings. Umar *et al*² identified significant irrational prescribing practices in the children's outpatient clinic of a teaching hospital in Zaria, Northern Nigeria. 41.2% of antibiotics prescribed were injections and only 48.2% of drugs prescribed were in generic names. Dahiyat *et al*⁷ in a private Paediatric health facility in Abu Dhabi also documented irrational prescribing. They found polypharmacy and also irrational antibiotic use for inappropriate diagnoses such as acute otitis media and bronchiolitis.

Additionally, 43% of antibiotics were prescribed for administration as injections.

Inappropriate prescribing of antibiotics for children was also prominent in primary care institutions in South-west China.⁸ Only 18.3% of antibiotic prescriptions were appropriate and the

percentage of unnecessary use, incorrect spectrum of antibiotics and combined use of antibiotics were 76.9, 2.4 and 2.4%, respectively.

There is a paucity of studies assessing prescribing practice in children's outpatient clinics in South eastern Nigeria. This study sought to address that by using WHO prescribing indicators to assess antibiotic prescribing practice in the children's outpatient clinic of the Federal university teaching hospital Owerri, Imo State.

Material and Methods.

This was a descriptive prospective study carried out in the children's outpatient clinic (CHOP) of the Federal University Teaching Hospital Owerri, Imo state Nigeria between April and June 2021.

The hospital is a tertiary care facility providing services to patients in Imo state and surrounding states of Rivers and Abia. The CHOP acts as the first point of call except for emergencies that are attended to in the Emergency Paediatric Unit.

The clinic runs Monday through Fridays but is closed on official government public holidays. It is often run by a team consisting of doctors of different cadre.

During the study period, medical record of patients who attended the CHOP and who had antibiotic(s) prescribed were collated. Information extracted included number of antibiotic(s) per patient, type of antibiotic, route of administration and clinical diagnosis. Additionally, it was also documented whether the antibiotic(s) was written in generic or brand name. Prescribing practice was assessed using the World Health Organization prescribing indicators.

Data Analysis.

Statistical Package for Social Science (SPSS) version 20 was used for data analysis. Results are expressed as means, frequencies and percentages. Chi square was used to determine the level of significance of groups of categorical variables with P values.

Ethical clearance.

Authorization for this study was granted by the department of Paediatrics, Federal University Teaching Hospital, Owerri.

Result.

The medical record of 478 patients who met the inclusion criteria were assessed. They consisted of 256 (53.6%) males and 222 (46.4%) females giving a ratio of 1.2:1. Out of 478 patients, 36.8% were less than 1 year old, 46.2% were between 1 to 5 years old, 9.6% were between 6 to 10 years old, and 7.3% were 11 years and above. This is shown in **Table 1**.

A total of 495 antibiotic medications were prescribed for the 478 patients giving the average number of antibiotics prescribed per patient encounter as 1.04.

(392) 79.2% prescriptions were in generic name while 20.8% in brand names.

Table 11 provides information on the number of antibiotics prescribed per patient. Out of 478 patients, 95.2% had one antibiotic prescribed, 4.4% had two and 0.4% had three prescribed.

Table 111 Provides information on the route of administration of prescribed antibiotics. Out of 495 antibiotics prescribed, 93.1% were to be administered orally, 4.2% were in the form of creams, 1.6% were injectables and 1% were in the form of eye drops.

16 of the prescriptions were not in the essential drug list and consisted of 12 oral medications and 4 creams for topical application. In essence only 3.2% of prescriptions were not from the Nigerian essential drug list, while 96.8% were.

The three most prescribed antibiotics were Amoxicillin/clavulanic acid (39.8%), Cefuroxime (24.4%) and Amoxicillin (11.1%). Others accounted for 24.7%. The three topmost diagnoses in the 478 patients were Upper Respiratory Tract Infection (URTI) 22.2%, Pharyngotonsillitis (20.3%) and Bronchopneumonia (10.7%).

There was a significant association between the number of antibiotics prescribed and age group of patients (chi-square = 62.7, df = 3, $p < 0.001$).

Assessment using prescribing indicators.

Average number of antibiotics per encounter	1.04
Percentage of antibiotics prescribed by Generic names.	79.2%
Percentage of encounters with injection prescribed	1.6 %
Percentage of antibiotics from NEDL	96.8 %

Table 1: Age distribution of patients.

Age	Number that had Antibiotics	Percentage(%)
Less than 1 year	176	36.8
1 year to 5 years	221	46.2
6 years to 10 years	46	9.6
11 years and above.	35	7.3

Total **478** **100**

Table 11: Number of Antibiotic(s) prescribed per patient.

<u>Number of antibiotics</u>	<u>Number</u>	<u>percentage(%)</u>
One	455	95.2
Two	21	4.4
Three	2	0.4
Total	478	100

Table111. Route of administration of prescribed antibiotics.

<u>Route</u>	<u>number</u>	<u>percentage.</u>
Oral	461	93.1
Injectable	8	1.6
Creams	21	4.2
Eye drop	5	1
Total	495	100

Discussion.

This study sought to assess the antibiotic prescribing practice in the children's outpatient clinic of the Federal university teaching hospital Owerri, Imo state using WHO prescribing indicators.

The average number of antibiotics per patient encounter was 1.04, this is in tandem with the recommendation of the WHO/INRUD Core drug use indicators. This shows that prescribing was rational with regards to the number of antibiotics prescribed per encounter. This is lower than

2.4 reported in Zaria² and 4.9 in Abu Dhabi⁷. Both studies reported figures above the optimal value. The Zaria study was retrospective and involved review of over 3000 prescriptions generated over a two-year period. The consequences of polypharmacy would include increased medication cost and increased risk of adverse drug reaction.

Antibiotics from the penicillin group (Amoxicillin, Amoxicillin/Clavulanic acid) were the most commonly prescribed followed by drugs from the cephalosporin class (Cefuroxime). This pattern has also been documented by several other studies^{2,7,8}. In our study the most commonly Penicillin prescribed was Amoxicillin/ Clavulanic acid while the most commonly prescribed cephalosporin was Cefuroxime. Cefaclor was documented in the study in Abu Dhabi⁷ while Ceftriaxone was in Zaria².

96.7% of all prescriptions were drugs included in the 2020 revised edition of the Nigerian Essential drug list⁹. While this is high, it does not meet the requirement that 100% of medicines should be prescribed from National Essential Drug List.

It should be stated though that the top three most prescribed antibiotics are in the Nigerian Essential Drug List.⁹ The Nigerian Essential Drug List is a carefully curated list of medications that have been deemed essential for addressing the most prevalent health issues in the country. Prescribing antibiotics from it offers several advantages for the healthcare system and patients by promoting the rational use of antibiotics and reducing the misuse and overuse of these drugs. The overall effect is that the burden on the healthcare system related to antibiotic resistance can be mitigated. This, in turn, contributes to the long-term sustainability of the healthcare system.

79.2% of antibiotics were prescribed as generics and it falls short of the prescribing practice optimal value of 100%. Umar et al in Zaria² also documented figures less than the optimal value but El-Dahiyat et al in Abu Dhabi⁷ reported a 100% prescribing in generic names. The difference may be the fact that the Abu Dhabi study was in a private health facility. Generic drugs are usually significantly cheaper than their brand-name counterparts thereby making medications more accessible and affordable.

1.6% of the prescriptions were injections. This is in tandem with good prescribing practices. It is lower than 16.9% documented in Abu Dhabi⁷ and 29.8% in Tiranna Albania⁹.

The administration of oral medications is non-invasive and is generally easier and more convenient to administer than injections. The convenience and flexibility of oral medications would lead to better patient adherence to the prescribed treatment plan.

Antibiotics were prescribed during the study period in the children's outpatient clinic for a variety of conditions but respiratory system pathologies were the most common. A similar pattern was found in Abu Dahbi⁷ and Tiranna¹⁰.

The most common medical diagnosis for prescribing antibiotics was Pharyngotonsillitis and the attendant finding that Penicillins were the most commonly prescribed antibiotics would be in keeping with recommendation by the Paediatric association of Nigeria.¹¹

We found a significant association between the number of antibiotics prescribed and age group (chi-square = 62.7, df = 3, p < 0.001). Specifically, a higher proportion of patients for which only one drug was prescribed were in the younger age groups (less than 1 year and 1 year to 5 years) compared to the older age groups (6 years to 10 years and 11 years and above). The reason for this is not obvious.

Conclusion

The antibiotic prescribing practice in the children's outpatient clinic is rational with regards to average number of medications per patient encounter and percentage of encounters with injection prescribed. It is irrational in terms of percentage of antibiotics prescribed in generic names and percentage of antibiotics prescribed from the Nigerian Essential Drug List.

Recommendation.

The doctors in the clinic should be regularly reminded of medications in the current Essential Drug list and also encouraged to prescribe in generic names. Regular audits of prescriptions should be carried out to enhance compliance.

Conflict of interest.

None declared by the authors.

Contribution of Authors.

EN and EN extracted and collating of data from the medical records of patients.

All authors were involved in data analysis and write-up.

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