

Prescription Pattern of Antibiotics in Paediatric Wards of a Tertiary Hospital in North West Nigeria: A Retrospective Study

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ABSTRACT

The main aim of this study was to evaluate the prescribing pattern of antibiotics in pediatric patients. A retrospective analysis of patients with bacterial infections admitted into the Paediatric Wards over a period of 3 months. Files of 100 patients were randomly selected and included in this study. A proforma was used for data collection, information retrieved from patients records include: Demographic Data, Culture and Sensitivity pattern, Clinical Information, Duration of Hospital Stay, Outcome, type, Class and Route of administration of antibiotics. Out of the 100 patients included in this study, 35(35%) were below one year, 50(50%) were between 1-5 years and 15(15%) were between 6-12 years. More patients between the ages of 1-5 years were admitted with bacterial infections. Out of the 100 patients included in this study 63 (63%) were males and 37(37%) were females. Out of the 100 patients, 27(27%) had septicemia, 48(48%) bronchopneumonia, 6(6%) osteomyelitis, 14(14%) had mixed infections. The remaining patients had urinary tract infection, upper respiratory tract infection and typhoid enteritis. In a total of 229 prescriptions, only 38 (16.6%) were prescribed based on culture result. Most of the antibiotic prescriptions were based on clinical diagnosis, not on culture and sensitivity pattern. In present study 83% of antibiotics were administered by parenteral route and 17% by oral route. The Cephalosporins were the most prescribed antibiotics. Cefuroxime 63(27%) was the most frequently prescribed antibiotic. Ampicillin with Sulbactam was found to be the most frequently prescribed drug combination.

Keywords: Antibiotics, Prescription, Septicemia, Bronchopneumonia

INTRODUCTION

Antibiotics are among the most widely prescribed drugs in Pediatric patients (Choudhury *et al.*, 2013). The world population constitutes of about 28% children and infants, these groups are more vulnerable to bacterial infections due to inadequate immune system (Moorthi *et al.*, 2011).

Antibiotics are prescribed to about 50% to 85% of paediatric patients in developed and developing countries (Paluck *et al.*, 2001). The central role of antibiotics in the treatment of infectious diseases that are prevalent throughout developing countries is undeniable (Palikhe, 2004). However, there are reports of an irrational use of antibiotics which increases the risk of resistance and cost of

treatment. Increase in drug resistance and limited availability of newer agents to treat multidrug resistant strains underline the need for rational prescribing (Aparna *et al.*, 2011). Rational use of antibiotic is necessary to avoid multiple drug resistance, treatment failure, non-compliance and increase in cost of therapy (Deshmukh, 2016). Evaluation of drug use in the elderly is a well-researched area, but drug utilization studies in paediatric population are limited (Thapaliya *et al.*, 2015). The main aim of this study is to evaluate the prescribing pattern of antibiotics in pediatric patients.

MATERIALS AND METHODS

The Study Area

The study was conducted at the Department of Paediatrics of a Tertiary hospital in North West Nigeria. The Department consists of the Paediatric Medical Ward (PMW), Emergency Paediatric Unit (EPU), the Paediatric Clinic and Special Care Baby Unit (SCBU).

Study Design

A retrospective analysis of patients with bacterial infections admitted into the Paediatric Wards of over a period of 3months

Study Population

Randomly selected files of 100 patients were included in this study

Inclusion Criteria

Patients admitted with bacterial Infections
Patients receiving antibiotics

Exclusion Criteria

Patients with co-morbidities or critically ill
Patients using antibiotic for prophylaxis purpose
Patients with Meningitis

Data Collection

A proforma was used for data collection, information retrieved from patients records include: Demographic Data, Culture and Sensitivity pattern, Clinical Information, Duration of Hospital Stay, Outcome, type, Class and Route of administration of antibiotics.

Statistical Methods

The data obtained was entered into a spread sheet using the Microsoft Excel 2010 and the analysis. Frequency tables and charts were constructed as appropriate. The significance of association between variables was tested using Chi-squared test, where appropriate, for comparison of proportions; while student t-test was used for comparison of means. The level of significance was set at $p < 0.05$.

RESULTS AND DISCUSSION

Age Distribution of patients

Out of the 100 patients included in this study, 35(35%) were below one year, 50(50%) were between 1-5years and 15(15%) were between 6-12years. More patients between the age of 1-5years were admitted with bacterial infections. This is similar to a study conducted by Dutta et al., 2017 which suggests that children of this age group are more susceptible to infections. Similar results were also reported in other studies (Laya *et al.*, 2015, Kebede *et al.*, 2017).

Table 1 Age Distribution of Patients

Age Distribution	Number of Patients (%)
Below 1year	35(35)
1-5years	50(50)
6-12years	15(15)
Total	100(100)

Sex Distribution

Out of the 100 patients included in this study 63 (63%) were males and 37(37%) were females. Similar results were reported by Thapaliya *et al.* 2015. According to Muenchhoff and Gaulder 2014, sex has a major impact on outcome from a range of infectious diseases in paediatrics with males having higher morbidity and mortality rates are higher in males than in females which could be attributed to stronger cellular immune response to infection or antigenic stimulation in females than in males.

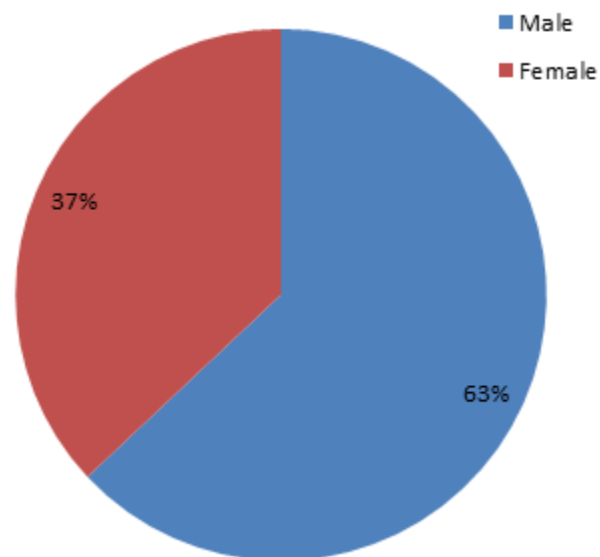


Figure I Gender Distribution of Patients

Pattern of Infection in patients

Out of the 100 patients, 27(27%) had septicemia, 48(48%) bronchopneumonia, 6(6%) osteomyelitis, 14(14%) had mixed infections. The remaining patients had urinary tract infection, upper respiratory tract infection and typhoid enteritis. Bronchopneumonia was the most frequently found infection this is similar to the study reported by Choudhury et al., 2013.

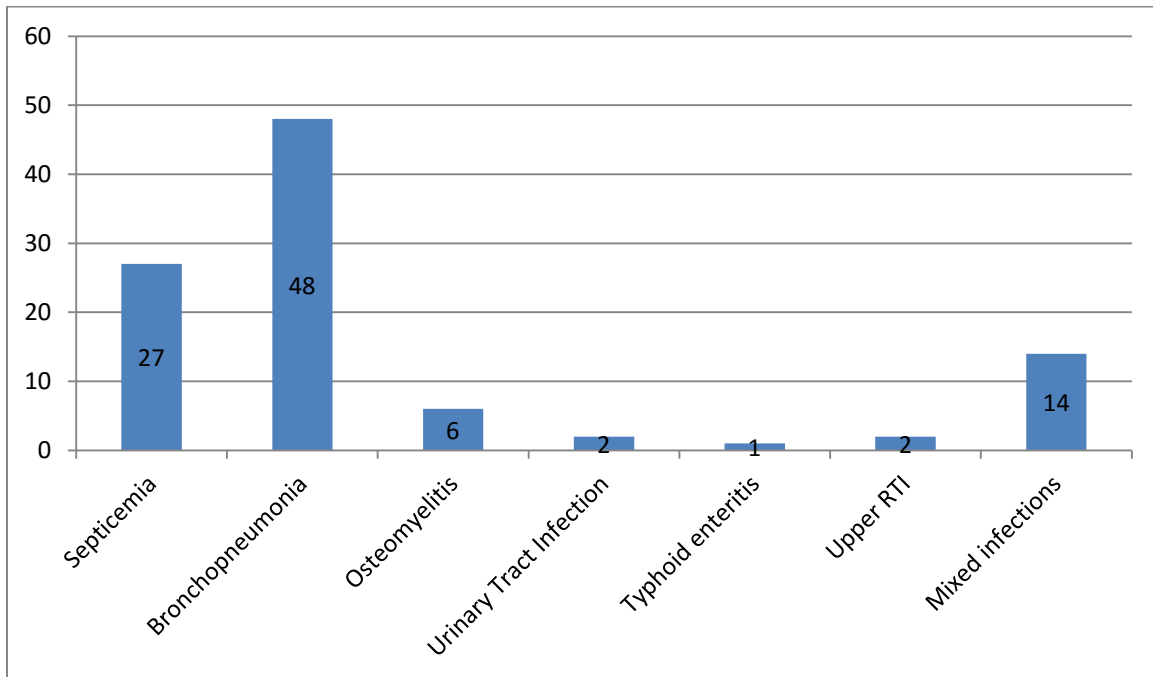


Figure II Pattern of Infection Distribution

Culture and Sensitivity Pattern

In a total of 229 prescriptions, only 38 (16.6%) were prescribed before culture report. Most of the antibiotic prescriptions were based on clinical diagnosis, not on culture and sensitivity pattern. Culture and sensitivity pattern is important for selection of antibiotics. This will prevent development of antibiotic also decrease the cost of treatment (Leung *et al.*, 2014)

Table 2 Culture and Sensitivity Pattern

Cultured Organism	Frequency (%)	Sensitivity
<i>Pseudomonas aeruginosa</i>	2(5.3)	Ofloxacin, ceftriaxone, gentamycin
<i>Escherichia coli</i>	5(13.2)	Ofloxacin
<i>Staphylococcus aureus</i>	2(5.3)	Gentamycin
<i>Klebsiella pneumonia</i>	2(5.3)	Ofloxacin, nalidixic acid
No growth	27(71.1)	N/A
Total	38(100)	

Route of Drug Administration of Antibiotics

In present study 83% of antibiotics were administered by parenteral route and 17% by oral route. WHO recommends lesser use of parenteral route as it is associated with other problems (Choudhury *et al.*, 2013).

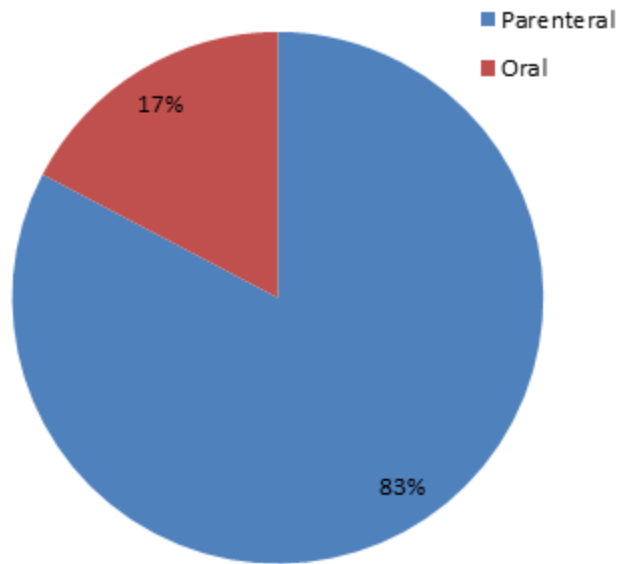


Figure III Route of Drug Administration of Antibiotics

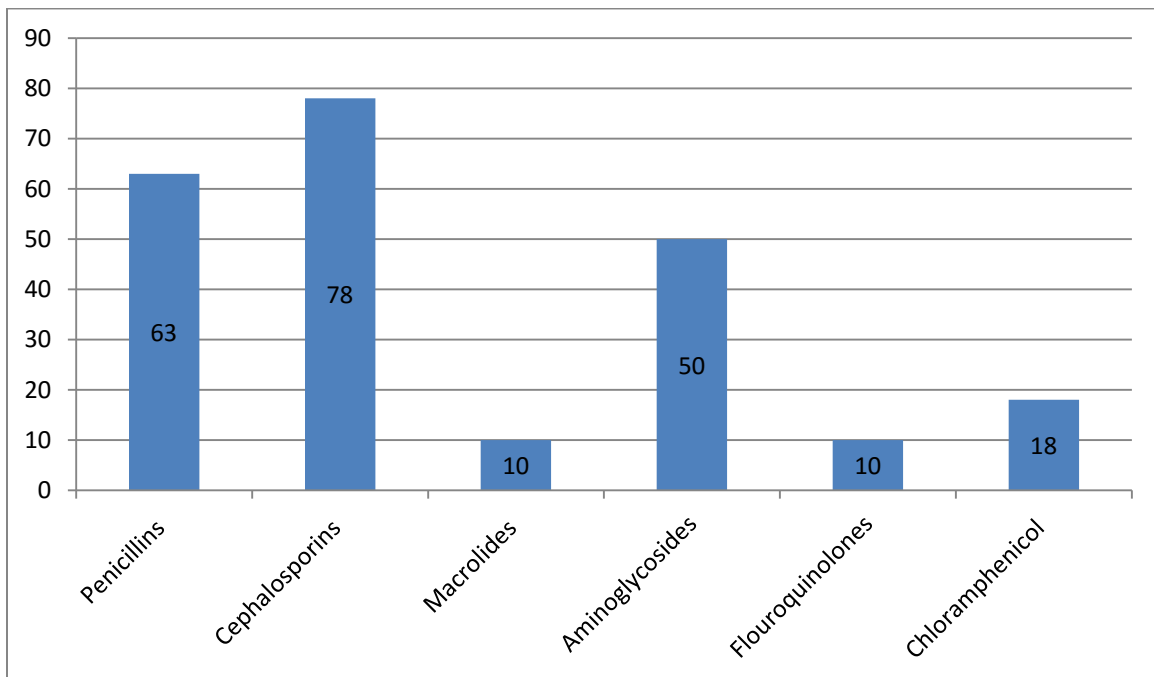


Figure IV Classes of Antibiotics Prescribed

The Cephalosporins were the most prescribed antibiotics which are in agreement with the study conducted by Kanish *et al.*, 2014 which reported that the most common antimicrobial agents prescribed were cephalosporins. Higher prescription rate of cephalosporin may be due to its broad spectrum of activity and tolerance across all age group (Goodman and Gilman 2001).

Antibiotics Prescribed

In this study cefuroxime 63(27%) was the most frequently prescribed antibiotic. Ampicillin with Sulbactam was found to be the most frequently prescribed drug combination, this is dissimilar to the study by Sriram *et al.*, 2008 which reported that the amoxicillin with clavulanic acid were the most prescribed. A study conducted by

Shamshy *et al.*, 2013 also reported that the most common combination of antibiotics prescribed were Amoxicillin with clavulanate.

Table 3 Antibiotics Prescribed

Antibiotics	Frequency (%)
Azithromycin	1(0.4)
Ampicillin+Clavulanic acid	8(3.5)
Ampicillin+Cloxacillin	6(2.6)
Ampicillin+Sulbactam	12(5.2)
Ceftriaxone	15(6.6)
Cefuroxime	63(27.5)
Chloramphenicol	18(7.9)
Ciprofloxacin	7(3.1)
Clarithromycin	3(1.3)
Cloxacillin	1(0.4)
Erythromycin	6(2.6)
Flucloxacillin	7(3.1)
Gentamycin	50(21.8)
Ofloxacin	3(1.3)
Penicillin V	29(12.7)
Total	229(100)

CONCLUSION

In this study, antibiotic prescription pattern was determined. Most of the antibiotic prescriptions were based on clinical diagnosis, not on culture and sensitivity pattern. Culture and sensitivity pattern is important for selection of antibiotics. Due to increase in antibiotics resistance prescription should be based on culture report.

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