

Study of Antibiotics Prescribing Pattern in Paediatric Patients of Thamar Province, in Republic of Yemen

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Abstract

The aim of this study was to determine the prescriptions pattern of antibiotic in paediatric in-patient department of General Thamar Hospital in Yemen. The method was prospective and observational study which was carried out for 2 months duration between March- April 2015. Patient's data was being recorded in a specific format and results were analysed by descriptive statistic and expressed as mean \pm SD. The result was out of 148 patients, 95 prescriptions were taken antibiotics, where 59 were male child and 36 were female child. The mean age of patient on antibiotic was 1.49 ± 2.12 years. The total antibiotics were prescribed to the patients was 194 and the average number of antibiotics per prescription was 2.04 ± 0.55 . The most prevalent diseases among studied patients was bronchitis (27.4%) followed by asthma (15.8%), and lower respiratory tract infection (9.5%). Cephalosporin (51.5%) was found to be widely prescribed antibiotic followed by penicillin (25.3), aminoglycosides (13.4), metronidazole (5.7%), vancomycin (2.6%), and azithromycin. The most of the antibiotics were administered for inpatients 183 (94.3%) prescribed parenteral, and 11 (5.7%) prescribed oral. The conclusion of study was Ceftriaxone and penicillin was identified to be the most prescribed medications in the General Thamar hospital. The selection of antibiotic should be based on culture and sensitivity test to avoid the development of bacterial resistance; however prescription of antibiotic should be done in accordance with WHO guidelines and rational strategies.

Keywords: Paediatric; Antibiotics; Prescription

Introduction

Antimicrobials are the most drugs prescribed for treatment of infections in Paediatrics department [1-6]. There is a lot of studies reported that 50% to 85% of children receive antibiotics in developed and developing countries prescribed by physicians [4]. The random use increases the risk of bacterial drug resistance and thus has prompted the need to use antibiotics judiciously in Paediatric practice [6]. Several of the antibiotics are unnecessarily prescribed for viral infections such as common cold, which lead to misuse or overuse of antibiotics [5]. The guidelines of antibiotic are standard set of guidelines for the treatment of infectious diseases based on local culture sensitivity data. These guidelines help the physician to prescribe the antibiotics rationally to Paediatric patients when definitely indicated [7]. Therefore, the rational use of antibiotic is an important way to reduce the problem of antimicrobial resistance. So, detailed reasonable knowledge of antibiotic prescribing pattern must be carry out in the clinical practice [8]. The use of antibiotics causes several harmful effects on the community and on the individuals, these include: The development of adverse drug effects that can be preventable such as gastrointestinal effects, increasing the burden of chronic diseases leading to an increase in the cost unnecessary spending in health services [9,10]. The most important harmful effect of using antibiotics is the development of bacterial resistance, which is currently one of the most important growing public health issues worldwide [11]. Bacterial resistance puts the community and individuals at risk, concurs with these results where they found some bacterial strains are very resistant resulting in fatal outcomes [12]. The emergence of resistant bacterial

strains have caused to an increase in the mortality and morbidity rates of previously treatable infectious diseases, such as: Acute respiratory infections, diarrhoea, and tuberculosis [13]. Also, antibiotic misuse is highly related to the development of bacterial resistance, such as failing to complete a course of antibiotic therapy, this might reflect the patient's/parent's low level of knowledge about antibiotics and their appropriate use [14-16]. Measuring the public's knowledge and awareness about antibiotics and their judicious use may ultimately reduce the problem of antibiotic resistance in the community, which can therefore protect the children from harmful and sometimes fatal bacterial infections. The reduction of uniformity in drug prescribing and the emergence of antibiotic resistance, monitoring and control of antibiotic use in Yemen particularly in children's was the main cause that pushed us to carry out this study. We have chosen the field of the antibiotics prescription due to the Paediatric group are commonly affected by various infectious diseases. The aim was to study the prescribing pattern of antibiotics in hospital of paediatric in-patient.

Materials and Methods

A prospective study has been conducted. The cross-sectional descriptive manner in order to assess Paediatric patients received antibiotic therapy, at General Thamar Hospital. Patient Profile and daily medication were recorded. 148 prescriptions of patients were found, out of these 95 prescriptions who received antibiotics. The age of patients were included in this study between 1 day to 8 years with diagnosis of respiratory, gastrointestinal, and other infections. Any prescription not having one antibiotic drug at least or any prescription includes intravenous fluids, blood transfusion and nutritional preparations, or any prescription taken out of March or April 2015 was

excluded from the study. The ethical committee permission was taken to conduct this study. Every admitted Paediatric patients were checked and different data like patient's file number, age, sex, body weight, diagnosis, duration of treatment with antibiotics, and duration of hospital stay were recorded. All data has been entered into Statistical Package for Social Sciences (SPSS) data base and analysed using descriptive statistics, and the results are presented as percentage and mean \pm Standard Deviation (SD).

Results

Among 95 patients were investigated from General Tamar Hospital, the highest number of patients was in age between 1 day to 11 months i.e., 67.4% and lowest number were in age between 3 years to 5 years i.e., 1.1%. The mean age of Paediatric patients was 1.49 years. The frequencies of antibiotics prescription among various age groups are shown in Table 1.

Age group	Male Number (%)	Female Number (%)	Total Number (%)
1 day to 11 months	43 (45.3%)	21 (22.1%)	64 (67.4%)
1 year to 3 years	10 (10.5%)	12 (12.6%)	22 (23.2%)
3 years to 5 years	0 (.0%)	1 (1.1%)	1 (1.1%)
5 years to 8 years	6 (6.3%)	2 (2.1%)	8 (8.4%)
Total	59 (62.1%)	36 (37.9%)	95 (100.0%)

Table 1: Frequencies of antibiotics prescription among various age groups.

Diagnosis	No. of Prescriptions
Bronchitis	26 (27.4%)
Pneumonia (LRTI)	4 (4.2%)
Meningitis	7 (7.4%)
Dehydration	9 (9.5%)
Fever (LRTI)	1 (1.1%)
Fever and Cough (LRTI)	4 (4.2%)
Diarrhoea	1 (1.1%)
Asthma	15 (15.8%)
Diabetes M	2 (2.1%)
Malnutrition	3 (3.2%)
Gastroenteritis	6 (6.3%)
Others	8 (8.4%)
Without diagnosis	9 (9.5%)
Total	95 (100.0%)

Table 2: Frequencies of the most diagnoses in prescriptions.

Out of 95 sample size, 59 patients were male and 36 were female. The percentage of male and female patients was 62.1% and

37.9% respectively. The most prevalent diseases among studied patients was bronchitis (27.4%) followed by asthma (15.8%), and lower respiratory tract infection (LRTI) i.e., pneumonia, fever, and fever and cough (9.5%), being in third position (Table 2).

The total 194 antibiotics were prescribed to the patients and the average number of antibiotics per prescription was 2.04.

Cephalosporins (51.5%) was found to be widely prescribed antibiotic followed by broad spectrum penicillin β -lactam (25.3), aminoglycosides (13.4%), metronidazole (5.7%), vancomycin (2.6%), and azithromycin (1%) (Table 3).

Concerning administration of the 194 antibiotics, 183 (94.3%) prescribed parenteral, and 11 (5.7%) prescribed oral.

Antibiotics	Male	Female	Total Number (%)
Cefotaxime	37	21	58 (29.9%)
Ceftriaxone	27	14	41 (21.1%)
Ampiclox	24	12	36 (18.6%)
Gentamycin	13	13	26 (13.4%)
Ampicillin	5	6	11 (5.7%)
Metronidazole	7	4	11 (5.7%)
Vancomycin	5	0	5 (2.6%)
Azithromycin	1	1	2 (1%)
Augmentin	0	1	1 (0.5%)
Amoxicillin	0	1	1 (0.5%)
Cefuroxime	0	1	1 (0.5%)
Clarithromycin	0	1	1 (0.5%)
Total	119	75	194 (100%)

Table 3: Paediatric patient's exposure to antibiotics.

Among 95 patients, 75 patients received combination antibiotic i.e., 78.9%. 20 (21.1%) received one antibiotic, 53 (55.8%) received two antibiotics, 17 (17.9%) received three antibiotics, 4 (4.2%) received four antibiotics, and 1 (1.1%) received four antibiotics (Table 4).

No. of Antibiotic (s)	No. of Prescriptions	Total No. of Antibiotics Prescribed
1	20 (21.1%)	20
2	53 (55.8%)	106
3	17 (17.9%)	51
4	4 (4.2%)	12
5	1 (1.1%)	5
Total	95 (100.0%)	194

Table 4: Number of paediatric patients exposure to antibiotics.

Discussion

The most number of the hospitalized Paediatric patients belonged to age group of 1 day to 11 months, in our Study results revealed that the most of susceptibility of Paediatric below one year towards different type of infective diseases. These results in agreement with previous study reported by Palikhe [5], in Kathmandu hospital, which revealed that infant less than one year received antibiotics more frequently than older children. The author also declared that this could be due to a higher susceptibility of infections at a younger age and needs a greater concern for infant's health relatively. In current study out of 95 sample size, 59 patients were male and 36 were female. The percentage of male and female patients was 62.1% and 37.9% respectively. The same findings were seen in other study reported by Choudhury and Bezbaruah [17] mentioned that sex has a major impact on outcome from a range of infectious diseases starting from the beginning of life. The current study results revealed that the most common cause of prescription of antibiotic was bronchitis (27.4%) followed by asthma (15.8%), and Lower Respiratory Tract Infection (LRTI) i.e., pneumonia, fever, and fever with cough (9.5%). These results are in agreement with previous studies show acute respiratory infection such as bronchitis is common prescription of antibiotics [3,12,17,18]. In addition, 1.9 million children worldwide die each year from acute respiratory illnesses, many of which are Lower Respiratory Infections (LRIs) reported by Klig and Shah [19]. In our study pneumonia was the second infection predominant disease among the Paediatric which was similar to the finding of the previous studies [4,18,20]. The time period which data collected for current study in March and April were most seasonal for prevalence of respiratory infection disease, very important to consideration the difference in the time period during conducted studies reported by Feleke et al. [20].

In the current study, the average number of antibiotics per prescription was 2.04 which was similar findings were seen in other studies in the Hospitals of Jazan Region, Kingdom of Saudi Arabia and Guwahati in Assam, India done by Khaled et al. [15], respectively. The average number of drug is an important indicator for assessing rationality of prescription. It is not better to keep the mean number of drugs per prescription as high. The WHO recommends that the average number of drugs per prescription should be less than 2. The average number of drugs per prescription value should be as low as possible to prevent the unfavourable outcomes of polypharmacy such as increased risk of drug interactions, increased cost of therapy, non-compliance and emergence of resistance in case of use of antimicrobials [21].

Antimicrobials are among the most commonly prescribed drugs in hospitals and in developed countries around 30% of the hospitalized patients are treated with these drugs [20]. In our study, cephalosporins were found to be widely prescribed antibiotic (51.5%). (Cefotaxime, Ceftriaxone and Cefuroxime) followed by broad spectrum penicillin (25.3%), Gentamycin (13.4%), metronidazole (5.7%), vancomycin (2.6%), and azithromycin (1%) respectively. These results are in agreement with a previous studies [3,17,20]. The higher prescription rate of cephalosporin could be attributed to its broad spectrum of activity and tolerance across all age group, and higher prescription rate of cefotaxime due to antibacterial activity against most gram-positive and gram-negative bacteria, including several strains resistant to other antibiotics, and recommended for serious infections caused by susceptible microorganisms [20-22].

In this study most common route of antibiotic administration was found to be parenteral route that accounted for 183 (94.3%) prescribed

parenteral, and 11 (5.7%) prescribed oral. There is several studies have similar shown the varying percentages of antibiotics were prescribed parenteral [3,5,23,24]. This is because the largest percentages of the prescriptions in our study were made up of parenteral which are available as parenteral route only and this may be due to the patients with infections produce a degree of physiological instability sufficient to require the monitoring and supportive functions of acute hospitalization, i.v. administration of antibiotics has been viewed by most clinicians [3].

In our study, varying percentage of antibiotics prescription to Paediatric patients. These results in agreement with previous study conducted by Palikhe [5] and Sriram et al. [23]. In contrast, others studies have shown single antibiotics have received high with previous study reported by Khaled et al. [15]; Feleke et al. [20]. This difference in antimicrobial prescription may be hospital protocol from one region to another. Our study has limitations by the fact that we relied on small sample size that may compromise the generalizability of the findings. The other disadvantage of our current study is short time so that it was difficult to know every point that need to be addressed.

Conclusion

This current study gives an overview of use antibiotics prescribing in the study area by age and sex distribution, diagnosed diseases, frequency and percentage of single as well as combined drugs prescriptions, and percentage of hospital stay with one or more antibiotics in Paediatric population. Management protocols did not fully abide to the current guidelines since culture and sensitivity tests were not carried out for most cases. The most common problem we have faced was the non-specific terms used in diagnosis as chest infection and upper respiratory tract infection. Physicians need to be more specific in their diagnostic terminology. We recommend from the results of this current study, that the professional organizations should take up projects to increase the awareness about antibiotic use among the practicing physicians through systematic approach and latest information in order to check the emerging problem of antibiotic resistance.

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