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Original Article

Study On Prescribing Pattern Of Drug With Assessing Rationality In Paediatric Outpatient Department In A Tertiary Care Hospital In Dhaka City

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Abstract:

Background: Rational use of drugs forms the corner stone of successful implementation of rational use of medicines. Irrational drug prescription leads to ineffective treatment, occurrence of adverse effects, prolonged duration of illness, suffering of patients, and an increased economic burden to society.

Objective: To see the pattern and rationality of drugs prescribed in OPD paediatrics patients in a tertiary care hospital in Dhaka city.

Methodology: A cross-sectional study was conducted at Department of Paediatrics, Dhaka National Medical College Hospital including pediatric age group prescriptions below 12 yrs for the duration of November 2018 to February 2019. Referral prescriptions and prescriptions of seriously ill patients were excluded from study.

Results: Various drug formulations were prescribed in the study. Most commonly found formulation was syrups and suspensions 304(60.8%) followed by solutions 69 (13.8 %).On an average, number of drugs prescribed per prescription was 3.12. Most commonly diagnosed disease was pneumonia in 105 (21%) of patients. 262 (52.4 %) prescriptions included one or more antimicrobial agents. Most commonly used antimicrobial agents were Amoxycillin in 62 (59%) patients followed by Ciprofloxacin in 27 (77.5%). The average cost per prescription was 216 tk.

Conclusion: The present study may provide feedback on concept of rationality in use of drugs to improve prescribing pattern.

Key words: Antibiotics, Outpatients, Pediatrics Department, Drug utilization, Prescription pattern.

Introduction:

The rational use of drugs requires the patient to receive medicines appropriate to their needs, in doses that meet their individual requirement, for adequate period of time and at lowest cost. Rational use of drugs forms the corner stone of successful implementation of rational use of medicines.[1] Irrational drug prescription leads to ineffective treatment, occurrence of adverse effects, prolonged duration of illness and an increased economic burden to society.[2]

Medically inappropriate, ineffective, non-economical uses of drugs are commonly observed in health care system throughout the world and especially in developing countries.[3] Inappropriate prescription increases the treatment cost, morbidity and mortality of the patient.[4] Third world population spends 30-40% of their total health budget on drugs many of which are prescribed irrationally.[1] Thus there is a real need to ensure that the prescriptions are always evidence based, cost effective & rational. Infant and children are the most vulnerable group that suffers from frequent but usually non-serious illness most of which are self limiting,[5] Sometimes they are treated inappropriately with polypharmacy.[6]

Potentially harmful medication error can be three times more common in paediatric population than in adults.[7] The invention of antimicrobials is a turning point in the reduction of the burden of communicable disease in the 20th century. Antimicrobials are among the most widely prescribed therapeutic agents across the world.[8] Prescribing pattern studies are powerful exploratory tools to ascertain the role of drugs in society. In a tertiary care centre, prescribing is expected to be judicious, appropriate, safe, effective and economical.[9]

In the recent years, there has been a rise in the broad spectrum antibiotic use. Inappropriate use of antibiotics has largely caused the development of antibiotic resistance.[10] Antibiotics use in children are different from adults due to different pharmacokinetics, pharmacodynamics, efficacy, safety and different physiological spectrum. Paediatric populations being vulnerable to the majority of the illnesses and the adverse effect of irrational use. This is a common problem across regions and there is a regional variation of the extent of this problem.[8]

Materials and Methodology:

A cross-sectional study was conducted at Department of Paediatrics, Dhaka National Medical College Hospital including paediatric age group prescriptions below 12 yrs for the duration of November 2018 to February 2019. Referral prescriptions, prescriptions of seriously ill patients and patient's attendance who did not give consent to review their prescriptions were excluded from study. Name of the patients and prescribing physicians were kept confidential throughout the study. Pre-designed, pretested semi-structured proforma was used for data collection. Necessary data were obtained from a total of 500 prescriptions and analyzed for (1) Number of medicines per prescription. (2) Drug route and indication. (3) Common paediatric problems. (4) Commonly used antibiotics for specific disease (5) Percentage of prescriptions with antibiotic drugs (6) Average cost of drugs per prescription. Data entered and analyzed with the help of statistical software SPSS Version 23. Mean and percentage were used for statistical analysis.

Results:

Majority 201 (40.2%) patients belonged to age 1-6 years, and were male 324(64.8%) (Table 1). Various drug formulations were prescribed in the study, Most commonly found formulations were syrups and suspensions 304(60.8%) followed by solutions 69 (13.8 %) (Table 5).

Average number of drugs was 3.12 per prescription. Prescriptions included one or more antimicrobial agents were 262 (52.4 %). Most commonly diagnosed disease was pneumonia 105 (21%). Common cold 92 (18.4 %), upper respiratory tract infection 48 (9.6 %) and gastroenteritis 40 (8.0 %) were other commonly diagnosed diseases.

In fever commonly prescribed drug was paracetamol (100%). In respiratory tract infection like pneumonia and common cold most commonly prescribed drugs were Amoxycillin 62 (59%) and Desloratidine 39 (42.39%) respectively. In upper respiratory tract infection Cefradine 31 (64.58%) was most commonly used. In acute gastro enteritis ORS and Zinc were prescribed for 100% of patients. Metronidazole 31(77.5%) and Ciprofloxacin 27 (67.5%) were subsequently prescribed most common drugs. In Bronchial asthma Salbutamol were prescribed in 16 (100%) patients. The cost per prescription was 216 tk. in average.

Table-I: Demographic characteristics of the study patients

Demographic characteristics	Number of patients	Percentage
Age (years)		
<1	162	32.4%
1-6	201	40.2%
>6	137	27.4%
Sex		
Male	324	64.8%
Female	176	35.2%

Table-II: Disease Pattern in Paediatrics OPD

Disease	Number of patients	Percentage
Fever	159	31.8 %
Pneumonia	105	21 %
Common cold	92	18.4 %
URI	48	9.6 %
Acute GI	40	8.0 %
UTI	24	4.8 %
Bronchial asthma	16	3.2 %
Worm infestation	16	3.2 %

Table-III: Prescription pattern of drugs in Paediatrics OPD patients

Disease	Prescribed drugs	Number of patients
Fever	Peracetamol	159 (31.8%)
Pneumonia	Amoxycillin	62 (59.0%)
	Cefradine	24 (22.8%)
	Cefixime	19 (18.09%)
Common cold	Desloratidine	39 (42.39%)
	Cetrizine	31 (33.69%)
	Dimenhydrinate Chlorp	12 (13.04 %)
	heniramine maleate	10 (10.86 %)
Upper Respiratory Infection	Cefradine	31 (64.58%)
	Cefixime	11 (22.9%)
	Cefuroxime	6 (12.5%)

Disease	Prescribed drugs	Number of patients
Acute Gastroenteritis	ORS	40 (100%)
	Zinc	40 (100%)
	Metronidazole	31 (77.5%)
	Ciprofloxcin	27 (67.5%)
	Nitazoxanide	12(30%)
	Azithromycin	9 (22.5%)
	Erythromycin	6 (15%)
Urinary Tract Infection	Ciprofloxacine	16 (66.66%)
	Cefuroxime	8 (33.33 %)
Bronchial asthma	Salbutamol	16 (100%)
	Montelukast	12 (75%)
	Theophylline	5 (31.5%)
Worm infestation	Pyrental pamoate	10 (62.5%)
	Albendazole	3 (18.75 %)
	Mebendazole	3 (18.75%)

Table-4: Others drugs used in paediatrics OPD

Drugs	Number of patients (%)
Anti-emetics	32 (6.4%)
H2 blocker	28 (5.6%)
Probiotics	24 (4.8%)
Vitamin D + Calcium	12 (2.4%)
Steroids	8 (1.6%)

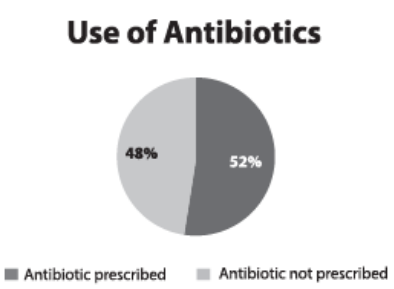

Figure-1: Percentage of antibiotic users

Table-5: Dosage forms of the study patients

Dosage forms	Number of patients	Percentage
Syrups and suspensions	304	60.8 %
Solutions	69	13.8 %
Inhalers	46	9.2 %
Tablets	34	6.8 %
Nasal drops	25	5.0 %
Topical	22	4.4 %

Discussion:

Paediatrics is the branch of medicine dealing with the development, diseases and disorders of children. Infancy and childhood is a period of rapid growth and development. Drug therapy is considered to be major component of paediatric management in health care setting like hospital.[11]

Antibiotics are the key drugs for treatment of infections and are among the most commonly prescribed drugs in paediatrics department.[12]

Their indiscriminate use increases the risk of bacterial drug resistance and thus have prompted the need to use antibiotics judiciously in paediatric practice.[13]

Therefore, a proper selection of antibiotics along with appropriate dose, formulation, pharmacokinetics profiles, response, and adverse drug reactions (ADRs) must be considered very seriously otherwise they may lead to fatal effects and promote the spread of antibiotics resistance.[14,15]

Nowadays many paediatric physicians are including antibiotics in their prescriptions as an empirical therapy without considering whether it is rational or not. The irrational use of antibiotics is leading to destruction of microflora, emergence of multi drug resistant microorganisms, and clinical symptoms like toxic megacolon and pseudo membranous colitis. All these are responsible for serious infections in the outpatients. This irrational use has lead to the development of "super bugs". Use of more combination of antibiotics are fearing the experts about future availability of antibiotics .Therefore, an effective step should be taken for rational use of antibiotics especially in the paediatric population.[16]

In this present study it was observed that majority (40.2%) patients belonged to age 1-6 years and 324(64.8%) were male. In a previous study.[10] It was observed that the most of the patients were belonged to age 1-2 years (34.67%), 80 (53.33%) patients were males while 70 (46.67%) were females. Another previous study[17] shows 55.3% were male. In a study[18] male patients were 9744 (54.13%) and female patients were 8256 (45.86%). Another previous study[2] showed 571(56.7%) were male patients and 372 (36.9%) were children aged 1–5 years, neonates were 24 (4.8%). Male patients were 273 (54.6%) and female patients were 227 (45.4%) in another study.[9] The male preponderance and the age group closely matches with the findings of the present study.

In this current study it was observed that patients presented with fever were 31.8%. Most commonly

diagnosed disease was pneumonia (21%) followed by common cold (18.4 %) and upper respiratory tract infection (9.6 %). Acute gastroenteritis (8.0%) and urinary tract infection (4.8 %) were subsequently diagnosed disease. Patients with dermatological complaints and those who came for immunization were sent to the respective centers. In a study[9] it was reported that upper respiratory tract infection173 (34.6%) was the most common reason for attending the pediatrics outpatient department followed by Bronchitis 81 (16.2%), Acute gastroenteritis 28 (5.6%), Fever 22 (4.4%), Asthma 13 (2.6%), Pneumonia 1 (0.2%), others 75 (15%) and Combination of two or more diseases were 107 (21.4%) patients. In another study[10] it was observed that respiratory system disease (33.33%) was most commonly seen, followed by GIT (19.33%) & CNS (16.67%) disorders. Findings of another study,[1] 12.6% drugs prescribed were those acting on respiratory system and other study[18] reported that majority of the paediatric patients were suffering from respiratory tract infection followed by Diarrhoea, Viral pyrexia, Epilepsy and Folliculitis. Another study[2] showed the most common diagnosis for which drugs were prescribed were respiratory tract infections (20.7%) and fever (16.4%). Considerable number of prescriptions were for immunization alone (249, 24.7%), of which injectable polio vaccine was the most commonly prescribed (143, 57.4%). In this study for fever paracetamol was prescribed in 100% patients. For pneumonia Amoxycillin (62.59%), Cefradine (22.8%) and Cefixime (18.09%) were prescribed commonly. Desloratidine, (42.39%) Cetrizine, (33.69%), Dimenhydrinate (13.04%) Chlorpheniramine maleate (10.86%) were frequently prescribed drug for common cold. Ciprofloxacin (66.66%) and Pyrental Pamoate (62.5%) was most commonly used drug for UTI and worm infestation respectively. Other drugs prescribed in this study were antiemetics (6.4%), H2 blockers (5.6%), Probiotics (4.8%), Vitamin D and calcium (2.4%) and Steroids (1.6%).

In a study[8] it was observed that the most common antibiotic prescribed for acute respiratory infection was Cefpodoxime followed by Azithromycin for acute diarrhoeal disease, for urinary tract infections, it was Cefixime. For a diagnosed case of viral fever, the commonest antibiotic used was Azithromycin. Findings of another study[19] was that the most common diagnosis in the patients was upper respiratory tract infection (URI) (50.07%) followed by acute gastroenteritis (20.94%) and viral fever (5.73%).

According to another study[20] respiratory system drugs (22%) and Paracetamol (13%) were the most prescribed class of drugs with predominance of salbutamol (8%). Anti-infectives for systemic use and gastrointestinal drugs were the most prescribed drugs in 0-6 years age group (26%) and ≥12 years (28%) age group, respectively. The drugs that were prescribed are similar to the current study.

Cefpodoxime (29.06%) and Paracetamol (86.70%) were used mostly in a study.[1] Another studies[18] reported a total of 37468 drugs were prescribed and most frequently prescribed drug class was Paracetamol. In a previous study[2] it was reported that antipyretics like Paracetamol were most commonly prescribed drugs (279/759, 36.8%), followed by antimicrobials (267/759, 35.2%). Another study[10] reported Penicillins (28.75%) were the most commonly prescribed antimicrobial agents, followed by Aminoglycosides (23.33%) & Cephalosporins (17.5%). Salbutamol aerosol (48.08%) was the most commonly used bronchodilator followed by inhaled Salbutamol+Ipratropium Bromide (21.15%). Out of 300 other group of drugs, IV fluids (30%) were most commonly prescribed, followed by vitamins (16.67%), ORS (13.34%), calcium (10%), zinc (9.33%), Prednisolone (3.33%) and Mannitol (2.67%) etc.

In this current study majority of common childhood illnesses are caused by viruses, which do not require antibiotics. Here 262 (52.4 %) out of 500 prescriptions (Fig-1) included one or more antimicrobial agents. Most commonly prescribed antibiotics include Amoxycillin, Cefradine, Ciprofloxacin , Cefixime and Cefuroxime . A study[21] reported that the proportion of antibiotic prescription was 79.4%. As against the WHO[22] recommendation of 20% antibiotic use for these common childhood illnesses. Which indicates that limited and proper use of antibiotics should be ensured for betterment of our future generations.

In a study it was seen that acute respiratory infection, acute watery diarrhoea and viral fever account for almost 60% outpatient visits, but only about less than 20% of these patients require antibiotic therapy.[22] In the recent years, there has been a rise in the broad spectrum antibiotic use.[23] Inappropriate antibiotic use for common childhood illnesses like respiratory tract infections, acute watery diarrhoea and viral fever has contributed to the development of antibiotic resistance.[24]

In this study it was observed that 304(60.8%) was found syrups and suspensions followed by 69(13.8%) solutions, 46(9.2%) inhalers, 34(6.8%) tablets, 25(5.0%) nasal drops, 22(4.4%) topical. However there is no use of injectable forms of medicine in out patient department. A study indicated that there was excessive use of injectables in many developing countries[18, 25]. Another study[26] shows that percentage of encounters

with an injection prescribed in both public (5.66%) and private (5.74%) hospitals was within recommended limit of WHO and there was no significant difference (p>0.05) regarding injection use pattern in these two hospitals. In a study[2] shows that various drug formulations were prescribed, highest being syrups (351, 34.8%), followed by injections (280, 27.8%), nasal drops (195, 19.3%), tablets/capsules (134, 13.3%), oral rehydration salts (ORS) (22, 2.2%), creams/ointments (15, 1.5%), and inhalers (11, 1.2%).

In the present study, on an average 3.12 medicines were prescribed per patient as compared to 2.3 and 2.22 from another study[27,28] respectively.

Other previous studies [6,17,29] found this number to be 5.86, 5.05 and 3.72 medicines per prescription respectively in their studies.

Another two study[26] show average number of drugs per prescription were 3.07 in public hospital and in private hospital it was 3.00 .The average numbers of drugs per prescription was 3.42 and range being 1 to 8. Out of 238 prescriptions studied 124 (51.26%) had at least one multivitamin, iron or tonic prescribed.[1]

The rationale use of drugs demands use of minimum number of drugs to reduce cost and drug interaction[19] So it is observed that in this study the average number of drugs prescribed per prescription was in accordance with similar studies done in India and in other developing countries with avoidance of poly pharmacy and that the final figure was acceptable and within the limit as per the WHO guidelines.[30,31]

The average cost per prescription in our study was 216 tk. A study[32] shows that in a teaching hospital average cost of prescription and average antibiotic cost is Rs.96.96 and Rs.45.30 respectively. In a Non-teaching hospital average cost of prescription is Rs.69.80 and average antibiotic cost is Rs.39.60 in India.

Another study[16] the average total prescription cost and antibiotic cost was Rs. 106.66 and Rs. 70.32 (hospital-1), and Rs. 245.41 and Rs. 113.32 (hospital-2), respectively. The average cost thus is more or less similar in comparison with other studies done previously in neighboring countries.

This study provides important insights into the prescribing patterns and rationality of drugs whether it is rational and also helped to identify any irrationality in the prescribing patterns of pediatrics outpatient department of a tertiary care hospital.

Conclusion: The total number of drugs and the number of antibiotics prescribed were found to be rational with regard to prescribing pattern as well as economic criteria. The ultimate goal of this study is to achieve rational and cost effective medical care, particularly in an economically developing country like ours.

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