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RESEARCH ARTICLE

Drug prescribing pattern for wheezers below one year of age: A cross-sectional study at tertiary care hospital from Northeast India

Chandrakala Sharma[1], Arkojit Endow[1], Rubi Dey[2], Sudip Dutta[3]

[1]Department of Pharmacology, Sikkim Manipal Institute of Medical Sciences, Sikkim Manipal University, Gangtok, Sikkim, India, [2]Department of Physiology, Sikkim Manipal Institute of Medical Sciences, Sikkim Manipal University, Gangtok, Sikkim, India, [3]Department of Paediatrics, Sikkim Manipal Institute of Medical Sciences, Sikkim Manipal University, Gangtok, Sikkim, India

Correspondence to: Chandrakala Sharma, E-mail: smimsck@gmail.com

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ABSTRACT

Background: The quality of the drug prescription depends on the physician knowledge and, in turn, affects the overall patient management. Irrational use of medicines, particularly in vulnerable age group, leads to adverse drug events and eventually the cost of treatment. Usually, there have been studies on the children as a whole, but there is scanty literature for wheezers below 1 year age. **Aim and Objective:** The present study was to understand the prescribing pattern for children below 1 year of age presented with wheezing and cough with or without fever in a tertiary care hospital. **Materials and Methods:** The patients of age up to 1 year presented with fever and cough with or without respiratory distress were included in the study. The data pertaining to the sociodemographic and clinical information were collected after seeking ethical clearance from designated committee of the institute. Data were analyzed using statistical software SPSS version 20.0. **Results:** A total of 432 drugs were found to be prescribed with average of 3.29 drugs per prescription prescribed for 131 patients, comprising mostly patients with lower respiratory tract infection (52) and viral wheeze (50) and others. Majority of the drugs were administered through inhalational route. The prescription recorded 126 (96.18%) bronchodilators followed by 82 (62.59%) antibiotics. Injection ceftriaxone was found to be the most prescribed antibiotics, and salbutamol was the most prescribed bronchodilators. Paracetamol was the only prescribed antipyretic. **Conclusion:** Prescribing pattern during the study fulfilled the WHO drug prescribing guidelines. However, the use of generic names and maximum use of injectables throughout the prescription was observed. The failure of treatment adherence attributed to the maximum use of parenteral preparation, minimizing of which would improve the quality of treatment by lowering the burden of adverse effect of drugs.

KEY WORDS: Polypharmacy; Wheezers; Prescriptions; National Essential List of Medicine

INTRODUCTION

Drug prescribing pattern is one of the important parameters of health-care delivery system and its role is indispensable for clinical education and economic purpose. The prescription pattern has direct bearing on treatment. Prescription pattern regulates the cost of treatment in developing country like India, and the cost of treatment affects the patient compliance and also has great impact on socioeconomic aspects.[1] Inappropriate prescription leads to increased morbidity and mortality and the cost of medical treatment.[2] Pediatrics pharmacology, as revealed from various literature, is practically different from adult one. The children are more vulnerable to various adverse drug reactions due to different pharmacokinetic and pharmacodynamic status of drugs in them.[3] The prescribing trend should be thoroughly monitored for neonates and infants, particularly when the

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treatment involves multidrug therapy.[2] There is a chance of failure of compliance to therapeutic regimen due to inconvenient dosing schedule with polypharmacy.[3] Thus, it is mandatory for all physician to ensure that the patients are given rational treatment. There are limited data on pediatric drugs prescribing patterns, not enough to establish the recommendation. Moreover, wide ranges of licensed drugs are not in appropriate doses form for pediatric use.[2,4] Irrational prescribing would lead to ineffective treatment, occurrence of adverse effects, prolonged duration of illness, and eventually the economic burden to the parents and society as a whole.[5] Therefore, it is of utmost importance to have updated data on prescribing pattern for improving patient care and to design the remedial measures in pediatric age group.

MATERIALS AND METHODS

A cross-sectional study for drug prescribing patterns for wheezers was conducted at pediatric department of Central Referral Hospital, Gangtok, for a period of 18 months with due approval from the Institutional Ethics Committee of Sikkim Manipal Institute of Medical Sciences. Written informed consent form was made in English and local language, and the consent was obtained from each parent/guardian before conducting the study in the language they understood better. The patients <1 year of age presented with fever and cough with or without respiratory distress were considered for the study. Only those patients whose parents/guardians gave prior consent were included in the study. Children with congenital lung and heart disease and with tuberculosis were excluded from the study. A predesigned, pretested semi-structured pro forma was used for data collection. The data were collected from prescription slips and patients case sheets at least twice a week during peak outpatient department hours. The information such as patients demographics, diagnosis, doses, doses form, routes of administration of prescribed drugs, average number of drugs per encounter, percentage of drugs prescribed by generic name based on latest edition of the Indian drug review, percentage of prescription with an antibiotics, percentage of prescription with injectables, and percentage of drugs prescribed from the essential drug list. The drug utilization data included categories/classes of drugs used for the treatment of mentioned cases. Data were entered into Microsoft Excel 2007 and analyzed with the help of statistical software SPSS version 20.0.

RESULTS

A total of 131 pediatric patients were enrolled in the study comprising 78 (59.5%) males and 53 (40.5%) females. A total of 52 patients were presented with lower respiratory tract infection (LRTI), 50 patients were with viral wheeze, and 15 were with upper respiratory tract infection [Figure 1] followed by others. The most common route for drug administration was found to be the inhalational. Oral route of administration was more common as compared to the parenteral route [Figure 2]. A total of 432 prescriptions were taken into consideration during the study. It was found that the average number of drugs per prescription was 3.29 [Table 1], with high frequency of three and four drugs per prescription [Table 2]. In 72 (54.96%) prescriptions, brand names of drugs were written. However, only 51 (38.93%) prescriptions were found with generic names of drugs [Figure 3]. Of the total prescribed drugs, 422 (97.68%) were prescribed from the National Essential List of Medicine (NELM) [Figure 4]. Bronchodilators were prescribed in 126 (96.18%) prescriptions, followed by antibiotics (82 prescriptions; 62.59%), antipyretics (69 prescriptions; 52.67%), and nasal drops (40 prescriptions, 30.53%), as depicted in Table 3. Among the antibiotics, beta-lactams were the highly prescribed drug, of which injection ceftriaxone was most prevalent [Figure 5], whereas salbutamol was the most frequently used drug among the bronchodilators and paracetamol was the only antipyretic prescribed in all the prescriptions [Table 4].

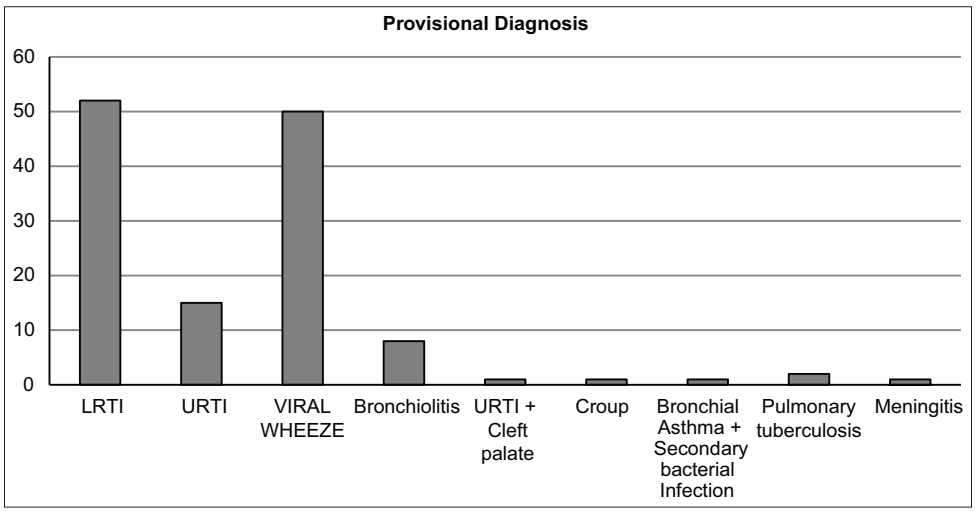

Figure 1: Diagnosis of wheezers with different comorbid conditions

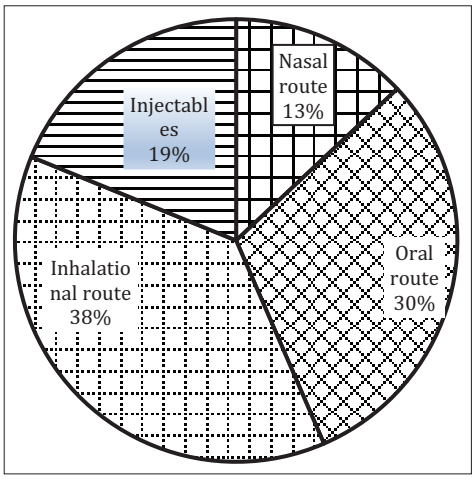

Figure 2: Percentage route of administration of drugs

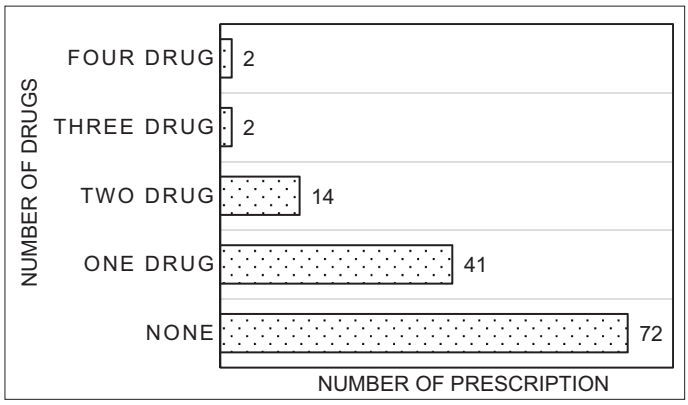

Figure 3: Number of prescriptions with average number of drugs with generic names

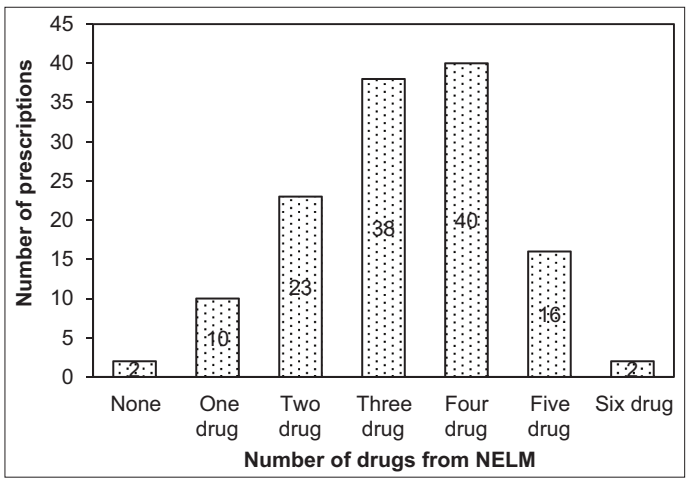

Figure 4: Number of prescriptions containing the drugs from the National Essential List of Medicine

DISCUSSION

This cross-sectional study attempts to check the prescribing trend in pediatrics, particularly below 1 year of age, and is pioneer study in this part of the country. There exists considerable gap in research in prescription pattern in pediatric age group, which leads to non-availability of pharmacoeconomic analysis data pertaining to its drug therapy. The medication errors are higher in infants and children than in adults,[6] as the children are vulnerable groups than adults.[5] There are reports of widespread off-label and unlicensed use of drugs ultimately leading to under or over dose of drugs in pediatrics.[7] Some studies have shown higher off-label prescriptions in children below the age of two years and in adolescents.[8] The foregoing text warrants the need of the study in prescription patterns for children and infants. The data generated and results analyzed from the present study would further help to understand, interpret, and improve the prescribing pattern of drugs in the pediatric population.

The present study showed the polypharmacy with 3.29 drugs per prescription. In majority of cases (54.96%), brand

Table 1: Number and percentage of drugs identified based on the WHO core prescribing indicators

Indicators	Value (%)
Total no of drugs used	432
Percentage of drugs prescribed by generic name	83 (19.21)
Percentage of drug prescribed from NELM	422 (97.68)
Percentage of prescriptions with injectable	58 (44.27)
Percentage of prescriptions with an antibiotic	82 (62.59)

NELM: National Essential List of Medicine

Table 2: Drug per prescription for wheezers below 1 year

Number of drugs/prescription	Number of prescription
One	10
Two	22
Three	39
Four	41
Five	17
Six	02
Total	131

Table 3: Different drug classes prescribed to pediatric patients (*n*=131)

Drug class	Number of prescription containing drug classes (%)
Antibiotics	82 (62.59)
Antiallergics	10 (7.63)
Bronchodilators	126 (96.18)
Nasal drops	40 (30.53)
Antipyretics	69 (52.67)
Cough syrup	21 (16.03)
MVI	02 (1.52)
Steroids	26 (19.84)
Gastrointestinal medications	8 (6.1)
Total prescriptions	131

Table 4: Different classes of drugs their formulations and number of prescriptions

Categories of drugs	Names and formulation used	Number of prescription
Bronchodilators (*n*=126)	Salbutamol nebulization	99
	Syp. levosalbutamol	11
	Syp. levosalbutamol + Montelukast	2
	Syp. salbutamol + ipratropium bromide	13
	Syp. levosalbutamol + ipratropium bromide	1
Anti- allergic (*n*=10)	Syp. Montelukast	4
	Syp. levocetirizine	1
	Syp. levocetirizine + Montelukast	5
Steroids (*n*=26)	Syp. Budesonide	1
	Inj. Hydrocortisone	17
	Inj. Hydrocortisone + Inj. Dexamethasone	2
	Inj. Dexamethasone	3
	Nebulize Budesonide	3
Gastrointestinal medications (*n*=8)	Inj. Ranitidine	6
	Syp. Ondansetron	1
	Tab. Lansoprazole	1
Cough syrup (*n*=21)	Syp. salbutamol + ambraxole	18
	Syp. ambraxole	3
Antipyretic	Paracetamol	69

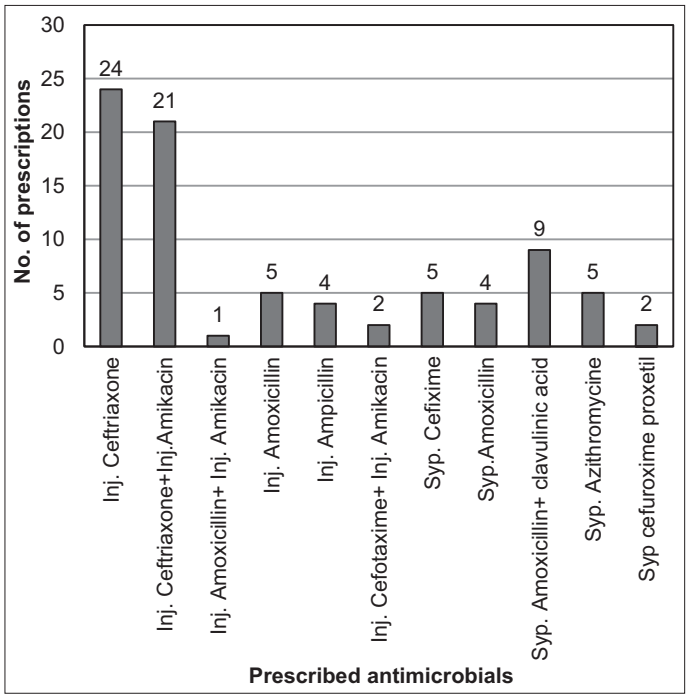

Figure 5: Number of prescriptions with antibiotics

name of the drugs was written. However, it was interesting to note that 97.68% prescribed drugs were from the NELM. Bronchodilators were found to be common prescription, followed by antibiotics, antipyretics, and nasal drops. Beta-lactams and injection ceftriaxone were found to be most prescribed antibiotics and salbutamol the most used bronchodilators. Paracetamol was sole antipyretic found in prescription.

The demographic profile in this study shows that male patients are outnumbering the female patients for consultation. Profile in such studies has been reported by different workers.[9-12] Majority of patients were suffering from viral wheeze and LRTI, and hence, it was found that the majority of the drugs were administered through inhalational route as compared to the oral and parenteral route. The observation on average number of drug per prescription was found to be higher than recommended[13] though results are in concurrence with one study.[14] The practice of polypharmacy in the present study has been found to be very common as the data have maximum number of prescription containing three to four drugs which increases the chances of drug interactions, adverse effects, and poor treatment adherence. Polypharmacy is one of the well-recognized issues all over the world which has direct bearing on cost of treatment and there is every chance of drug interaction and adverse effect. In this study, maximum number of prescriptions listed three or four drugs which has contributed to increased average drug per prescription almost to double the limit of the WHO.[13] Low-cost therapy with rationality is one of the important parameter stated by the WHO. There are various means to implement the same by the prescriber in their day-to-day practice and one of them is prescribing the drug by generic names and keeping the brand names as low as possible in their prescriptions. Prescription of drugs using generic name is a recommended practice; however, this study showed significantly less prescription using generic names. Similar trends have been reported by other researchers.[2,15] The non-availability of the pediatric formulations by generic names in the hospital pharmacy could be the reason for not adapting such practice

by the pediatricians.[16,17] The use of drugs from the NELM is maximum as compared to the results obtained from other studies.[12,18-20] Adoption of essential medicine concept(s) would minimize the cost of therapy which is a core parameter of a good prescription writing.

There were certain trends on usages of the classes of drugs during this study, the trends corroborate with some other studies[21,22] where bronchodilators were used to its maxima followed by antipyretics along with antibiotics in most of the prescriptions. It is justifiable to follow similar pattern of prescription when we observe the inclusion criteria of the participants in our study. A common similarity was observed in many studies[7,12,18,23,24] where there was minimal use of antipyretics other than the paracetamol. As a matter of fact, paracetamol is the safest of all the antipyretics for all age groups. Similar to the use of paracetamol, another most commonly prescribed drug in pediatric age group in our study is the use of salbutamol (either inhalational or oral formulations). Another observation from studies is that there is slight variation in use of anti-infective agents. In our finding, the use of injectable antibiotics, particularly ceftriaxone, was most common than the oral preparations which is contradicting to the results of other studies.[23-26]

Major limitation this study was the smaller sample size and the samples would have taken from different hospitals to interpolate more data.

CONCLUSION

The practice of polypharmacy is followed exceeding the WHO recommendations. Some basic guidelines in prescription are not followed even at the tertiary care hospital. It is recommended that prescribing patterns in pediatric age group for at least common ailments should be formulated and circulated to the primary health-care level so as to bring about uniformity. This will help in overcoming the various undesirable drug interaction and adverse effects. It will also help the health-care professionals to avoid polypharmacy and judicious use of drugs in the most vulnerable age group. Such study may be taken with more sample size in future.

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