



Prescribing Pattern of Drugs among Pediatrics Population Affected with Diarrhea and Pneumonia Infections in a Tertiary Care Teaching Hospital

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Abstract

Diarrhea and pneumonia are one of the major causes for morbidity and mortality among children below 5 years in India. As per WHO, The causes of childhood deaths showed a striking shift. In 2000, the leading causes of the 10.8 million deaths were neonatal conditions (33%), diarrhea (22%), pneumonia (21%), malaria (9%) and AIDS (3%). In 2015, the leading causes of the 5.9 million deaths were preterm birth complications and other neonatal causes (45%), pneumonia (16%), diarrhea (9%), malaria (5%), and AIDS (1%), strongly suggesting that scaled up coverage with interventions had a major impact. The aim of the present study is to find the prescribing pattern of drugs to the patients admitted in the pediatric ward who were diagnosed and treated for diarrhea and pneumonia in a tertiary care teaching hospital.

The present study is a Prospective observational study. The study was carried out between December 2016 and September 2017.

Totally 446 case profiles were selected for the study. 64.12% patients were admitted for diarrhea and 35.88% patients for Pneumonia. The prevalence rate of diarrhea was found to be more in > 1 year of age group. All the diarrhea patients were treated with ORS and Zinc Supplements. LRTI patients especially with pneumonia were found to be higher in > 5 years of age group. Where these patients were prescribed with cephalosporins (82%), aminoglycosides (82%) followed by bronchodilators (100%) and corticosteroids (36%).

This shows that Diarrhea is still highly predominant cause of morbidity in the pediatric population than that of Pneumonia and the vulnerable age group among the pediatrics are >1 year in case of Diarrhea and >5 years for Pneumonia.

Keywords: Pediatric, Prescription Pattern, Diarrhea, Pneumonia.

Introduction

Diarrhea and pneumonia are one of the major causes for mortality among children under the age of 5 year in India. It contributes to 10% of death among the infantile and 14% death among the

pediatric population. Approximately 300,000 children die due to diarrhea every year, signifying the requirement of further measures to strengthen preventive measures. There were a total of 1.31 million deaths as a result of diarrhea globally in

2015, including 499,000 child deaths. Pneumonia is a leading cause of childhood morbidity and mortality globally. It is estimated that there were over 120 million episodes of pneumonia among children younger than five years during 2010–11; of which over 10% were severe episodes (Bhutta ZA et al). A recent systematic review estimated 0.22 pneumonia episodes per child–year in developing countries alone, with nearly one in eight cases progressing to severe disease. Yet another systematic review estimated nearly 12 million hospitalizations in 2010 due to severe pneumonia and 3 million due to very severe disease (Rudan I et al). Irrational use of medication is a major global issue. According to the World Health Organization (WHO), more than half of the medications, which are prescribed, dispensed and sold are irrational and more than 50% of the medications being administered are inappropriate. Overuse, Underuse, and Misuse of the prescription and the Over the Counter drugs were found to be in association with the irrationality of medications. It may also be due to inappropriate usage of antibiotics for nonbacterial diseases with poor screening, Poor patient compliance with inadequate adherence and also due to nonessential usage of polypharmacy.

Though drugs are only a part of therapeutic interventions, rational usage of them plays a significant role in the efficiency and sufficiency of those therapeutic interventions. Rational usage of medications implies that the patient receives the right dose at the right time and at right frequency with adequate information and regular follow-ups at affordable cost. An illustration of the irrationality in the prescription includes over and under prescribing, nil specificity in the prescribed medications, inappropriate usage of antibiotics, reasonless usage of uneconomical medications and polypharmacy. In addition to the overpriced cost of treatment, insignificant prescribing of drugs causes inferior, insecure treatment, exacerbation of the disease condition, misery and abuse to the patient.

Like other countries, irrational usage and prescribing of medications is a common and significant complication in India, and requires immediate consideration. Due to increased expenditure of improper usage of regimens, India and other developing countries encounters increased complications due to decreased and poor economic resources and inappropriate drug practice. In order to promote good quality of prescription practice and promote rational usage of medications there is an assured need to scrutinize the factors that affect the physician's prescription pattern. Studies have also demonstrated that there is a correlation between the prescription patterns and demographic data's. Assigning drug prescription and consumption pattern provides superior evaluation to the physicians in order to promote rational usage and practice of prescription pattern. Prescribing investigation inspection guides the policymakers to set the preferences to develop the rational usage of medications nationwide.

The present study deals with infectious disease which accounts for 58% of all deaths among children aged up to 5 years. Among which about 20% of deaths were due to diarrhea and 12% were due to pneumonia and around 8% due to measles and 10% due to central nervous system infections where 8% due to other infectious diseases, as per the survey report of WHO 2016. India has the highest number of pneumonia and diarrhea among children in the world with nearly 3 lakh children dying in 2016, a new report released ahead of the World Pneumonia Day on November 12. India ranks the First, among the top fifteen countries with the highest global burden of Child Pneumonia and Diarrhea Deaths according to the Pneumonia and Diarrheal Progress Report 2016 which was released by International Vaccine Access Center (IVAC).

Aim

To study the prescribing pattern of drugs among the pediatric populations on pediatric prone infections in a tertiary care teaching hospital.

Method

A prospective observational study was carried out during the period of JUNE 2017 – OCTOBER 2017. The study was carried out at a medical college hospital located in Chidambaram, Cuddalore District, Tamil Nadu with very low treatment cost. The study included in-patients from the pediatric wards covering a total admission of around 446 patients who have been admitted, diagnosed and treated for diarrhea and pneumonia during the study period of 5 months.

Inclusion criteria 1. All the children below the age group of 7 years who visited the In-Patient Pediatrics department.

2. Cases were identified from the prescriptions of the case profile among the recruited patients.

Exclusion Criteria: 1. Patients who only visited the Out-Patient department.

2. Other Lower Respiratory Tract Infections like Bronchiolitis, Lung Abscess, Asthma etc.

Information identified from the case profile includes the demographic details with their Inpatient number along with their ward and unit details. When it comes to the prescription of the case profile, assessment included the prescribed medications, their route of administration and their frequency. Data has been collected from the previous case sheets in a predesigned format. All the correspondent details were collected by a complete view of the profiles, medication records, and other relevant details from the case profile. The information was interpreted with the consultation of the Pediatrician treating the patients. Confidentiality of data was also maintained in all aspects throughout the study.

Demographic details including age, gender, body weight were identified. Prescription was analyzed and the details including the various categories of drugs including their routes of administration with the proportionate usage of antibiotics were also interpreted. The data collected were then scrutinized for their appropriateness and assessed for their correlation with that of the Standard Treatment Guidelines. The collected data's were also screened and compared with that of the

National List of Essential Medicine List 2017. The medications prescribed were also viewed and assigned with respect to their brand and generics. The collected results were then expressed in terms of frequencies and percentage. The study was undergone after proper approval from the Institutional Human Ethics Committee of the hospital. The permission to view the prescription was obtained from the Medical Superintendent and Head of the Department of Pediatrics from the hospital.

Results

A total of 446 profiles were taken into account for the study. 286 cases diagnosed for diarrhea and 160 diagnosed for pneumonia. Initially the outline of the whole case profile was interpreted, from which it was found that in the month of June there were about 91 patients out of which 56 diagnosed and treated for diarrhea and 35 were diagnosed and treated for pneumonia, in the month of July it was around 87 patients in which 63 accounted for diarrhea and 24 for pneumonia, in the month of August it was nearly 98, out of which 52 for diarrhea and 46 for pneumonia, in the month of September it was around 93 patients out of which 56 patients under diarrhea and 37 for pneumonia and finally in the month of October it was 77 out of which 47 were diagnosed for diarrhea where 30 diagnosed and treated for pneumonia.

Secondly, the demographic details of the study population were ascertained. In the case of diarrhea it was found that there were nearly 5 neonates (up to 4 weeks) and 186 infants under the age group 4weeks-1year and 55 children under the age group of 1-6 years and 41 children between 6-12 years. And in the case of lower respiratory tract infection it was found that 32 infants between the age group (4weeks-1year) and 76 under the age group 1-6 years and 52 children between the age group of 6-12 years. It was highly evident that diarrhea was highly prominent between the age group below 1year and the lower respiratory tract infection was highly predominant between the age group of 1-6 years.

Table 1 Outline of the cases

	June	July	August	September	October
Diarrhea	56	63	52	56	47
Pneumonia	35	24	46	37	30
Total no. of patients	91	87	98	93	77

Table 2 Demographic details of the patients

	N%	
	Diarrhea	LRTI
Age		
Neonates(upto4weeks)	4	-
Infants(6weeks-1year)	186	32
Children (1-6years)	5	76
Children (6-12years)	41	52
Gender		
Male	236	98
Female	50	62
Body weight		
Upto 6kg		
6-12 kg	143	19
12-18 kg	48	106
18-24 kg	3	-

The prescription from the case profile was collected and assessed, different categories of antibiotics were prescribed depending upon the severity of the patient and wide range of antibiotics were also prescribed owing to the patients different co-morbid conditions, about three different categories of antibiotics namely Third Generation Cephalosporins, macrolides and aminoglycosides were also used owing to their synergistic actions. The other categories of drugs prescribed include zinc supplements, corticosteroids, anti-emetics, bronchodilators, analgesics and antipyretics depending upon the patient's conditions. Various routes of administration of the drugs were also scrutinized which includes oral accounting for nearly 49.5%, followed by intravenous route of administration accounting for about 49%, which is followed by inhalational route accounting for 19.8%, and other routes of administration including rectal accounting for 8% were being prescribed.

The various dosage forms of the drugs including injections about 94%, syrups for nearly 90%, powder for reconstitution in the forms of rehydration salts about 88% tablets for nearly 86%, drops for nearly 72% capsules of around 42% and suppositories via rectal for around 4%

were been prescribed. The study also evaluated the proportion of antibiotics utilized owing to the patients conditions. It was found that 70% of drugs being prescribed were Antibiotics. Among the prescribed antibiotics, 60% comes under NLEM list of 2017. The percentage of antibiotics utilized for pneumonia and bronchitis were found to be 100%, whereas in the case of diarrhea it was prescribed for about 39%. It was found that cephalosporins were found to be the most frequently prescribed antibiotics accounting for nearly 70% and among those Ceftriaxone, Cefotaxime, Cefdinir, Cefixime were being prescribed widely, followed by aminoglycosides along with the cephalosporins for their synergistic actions accounting for about 70% from those highly used were Gentamicin and Amikacin. In addition flouroquinolones were extensively prescribed which includes Ciprofoxacin, Norfloxacin with the combination of Metronidazole and Tinidazole were the least prescribed drugs.

Finally the drugs prescribed were compared with that of the Standard Treatment Guidelines. It was stated as such if a child is diagnosed with diarrhea and if it was able to drink it should be administered with ORS (5ml/kg/hr) by mouth. If the child is above 2 year, it can be prescribed with oral antibiotics. Therapeutic regimen includes Zinc salts 10mg (sulphate, gluconate, acetate) upto 6 months of age and above 6months of age the infant can be administered with 20mg of elemental zinc as soon as the diarrhea starts from a period of 14 days. In the case of pneumonia it was stated that between 3months -5years of age, as a first line treatment the patient has to be administered with Amoxicillin for a period of 7 days and in the case of second line treatment Amoxicillin with clavulanic acid as a combined form for a period of 2 weeks or Second generation

Cephalosporin Cefuroxime and also 3rd generation cephalosporin can also be administered For a period of 1 week.

Table 3 Category of Prescribed Drugs

Category of drugs prescribed	N%	
	Diarrhea	LRTI
Antibiotics	39	100
Zinc supplements	93.4	81.8
Corticosteroids	4	36
Anti-emetics	13	13.6
Analgesics & antipyretics	65	27
Bronchodilators	4	100

Table 4 Route of Administration

Route of administration	N%
Oral	49.5
Intravenous	49
Nasal	19.8
Rectal	8

Table 5 Type of Dosage Form

Dosage forms	N%
Injections	94
Syrups	90
Tablets	86
Drops	72
Capsules	42
Suppositories	4

Table 6 Proportion of Different Types of Antibiotics Prescribed

Antibiotics	N%
Third generation cephalosporins	82
Aminoglycosides	82
Anti-amoebic and anti-protozoals	72
Macrolides	66

Discussion

To the best of my knowledge till date, this seems to be the first study which has assessed the prescription pattern and investigated their correlation with that of the Standard Treatment Guidelines and National List of Essential Medicine list and scrutinized their appropriateness across Southern part of Tamil Nadu. Less number of literatures is known to be available in the southern region regarding the use of the generic medicines and the use of medicines from the NLEM for infections. This study would definitely serve as the most needed reference for the

prescribing pattern of drugs for pediatricians in the Southern India and also would serve for the future reference studies.

The results indicate high extensive usage of antibiotics among the children below the age of 5 years, for Pneumonia and Diarrhea.

This report expanded the speculations about the usage of antibiotics below the age group of 5 years, though the report obtained is in interconnection with the reports of other developing countries. The report obtained is not in relevance with the Standard Treatment Guidelines, there could be a valid point on justification of why and wherefore usage of extensive antibiotics among the pediatrics. We could contemplate the causes for this, and it could be narrowness of knowledge about usage among the healthcare professionals, poor application of amendments made in hospitals of developing countries particularly rural areas and the other justifying reasons could be inadequate and inferior quality of laboratory facilities for culture of organisms to find out the sensitivity of organisms to the antibiotics which has lead to extensive prescribing of broader spectrum antibiotics.

The study shows the conventional usage of cephalosporins with adjunct usage of aminoglycosides. The inference found is analogous to that of another study about wide use of broad spectrum antibiotics among children suffering from respiratory infections and dehydration. It has been found that NLEM has brought solutions to many health complications and promotes the rationale use of drugs. The current study reported about 60% antibiotics prescribed correlated with the National list of essential medicines. The probable cause could be poor knowledge, insufficient availability of listed essential medicines in the hospital, short fall of needed policies and failure in enforcement of existing guidelines for rational prescription practice in compliance with standard treatment guidelines.

The result signifies that a highly qualified medical practitioner with updated knowledge can promote

rational drug use. Awareness programmes on rational use of medicines, including a knowledge center and sustained support for continuing medical education programmes would help in promoting rational use of drugs. The result depicts both merits and demerits about the study. This study evaluated the widely prescribed drugs for pediatric infections like diarrhea and pneumonia. The need for the qualified personnel in tertiary health care institutions are alike in other state hospitals, this could not be generalized due to lack of literatures. The results may not be applicable to the primary health care set ups and other clinics.

Conclusion

Thus the most frequent and serious infections among the pediatric population have been brought to light and their age and gender susceptibility has also been figured out. From the assessment of the prescription pattern from their case profiles it has been found that high proportions of antibiotics were been prescribed among the pediatric population against the WHO guidelines but justifiable reasons were also noted and above all, from the comparison of the prescription pattern with that of the Standard Treatment Guidelines and National List Of Essential Medicine List, almost most of the drugs were being prescribed in correlance with that of the guidelines and reasonable violation of the treatment guidelines were also been spotted out. Further continuous awareness programmes and workshops on disease management and antibiotic usage may still enhance the rationality of prescription pattern among the pediatrics.

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