ASSESSMENT OF PRESCRIBING PATTERN OF ANTIBIOTICS AND PROBIOTICS IN
PAEDIATRIC DIARRHOEA AT PALAKKAD: A PROSPECTIVE STUDY

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ABSTRACT
The study was aimed to analyse the prescribing pattern of probiotics and antibiotics in paediatric patients. The study was conducted in the paediatric department of 350 bedded multispecialty tertiary care hospital. During the period of 6 months study, 243 prescriptions containing probiotics and antibiotics were collected and analysed using a structured data entry format. The prevalence of diarrhea was seen more in males (62.1%). Out of the 243 prescription reviewed, Bacillus clausii was the most commonly prescribed probiotics, and 16 patients were given combination of probiotics. Antibiotic prescribing pattern was also studied from which shows that Cephalosporin class of antibiotics were mostly prescribed (28.94% in males and 15.43% in females). The results obtained in the study indicate that antibiotic and probiotics were prescribed jointly more than individually.

Keywords
Antibiotics, Diarrhoea, Paediatrics, Probiotics, Prescription pattern.

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INTRODUCTION

Diarrhoeal diseases are the leading cause of childhood mortality and morbidity in developing countries and an important cause of malnutrition. [1] According to the most recent estimates from the WHO, there are approximately 2.5 billion cases of diarrhoeal illness each year. The burden of disease is especially severe in paediatric population, resulting in 1.5 million deaths annually in children under the age of five. Second only to pneumonia, diarrhea is responsible for 3% of neonatal mortality and 25% of post-natal mortality. These numbers together account for more paediatric deaths than AIDS, measles and malaria combined. [2] In developing countries, it is estimated that >2 million people, mostly infants and children, die of dehydration due to diarrhoea each year. Diarrhoea remains a common problem in developed countries. [3]

The majority of diarrhoeal deaths are caused by dehydration that can be treated with oral rehydration solution. However, ORS is unable to reduce the volume, frequency and duration of diarrhoea. Oral rehydration therapy is the cornerstone of management of dehydration. Intravenous fluids are not routinely recommended except in case of persistent vomiting or shock. Morbidity and mortality associated with diarrhoeal diseases are reduced with administration of an oral rehydration solution. [3, 4]

Probiotics are viable microorganisms that are thought to have a beneficial effect in the prevention and treatment of specific pathologic condition. They consist of either yeast or bacteria, especially lactic acid bacteria. Probiotics in generally enhances the intestinal microflora by replenishing suppressed bacteria and inhibiting the growth of pathogenic flora. Probiotics have been used as growth promoters for lactose intolerance, anti tumor and anticholesterol effects. Probiotics is used for the prevention, treatment or recovery of travelers’ diarrhea, antibiotic associated diarrhea, other infectious diarrhea or AIDS related diarrhea. Probiotic can also be used for different condition like urinary tract infection, vaginal disimicrobism, immune disorders, bladder and colon cancer and in hypercholesterolemia. Probiotics in general help in the balance of the intestinal micro flora. The most studied gastrointestinal condition treated by probiotics is acute infantile diarrhea. Probiotics have the potential to reduce intestinal permeability and the generation of proinflammatory cytokines that are elevated in patients with a variety of allergic disorders. [5]

Antibiotics are the agents which are commonly used in the treatment of bacterial infections and are considered to be the mainstay of treatment for children and hence it is the second leading drug prescribed according to the National Ambulatory Medical care surveys. Although antibiotics are effective and play an important role in the management of infectious disease, they can lead to many serious consequences. Their indiscriminate use leads to emergence of resistant strains of harmful bacteria and eliminates resident flora which protect the gut. Antibiotic use is recommended only for acute bloody diarrhea/ dysentry. Antibiotics can be used for different infectious disease like pneumonia, meningitis, enteric fever, pleural effusion, urinary tract infection, and respiratory tract infection etc. the use of antimicrobial agents, especially antibiotics has become a routine practice for the treatment of paediatric illness. As per local standard treatment guidelines also, antibiotics are not recommended for acute diarrhea in adults. Unfortunately, diarrhea is a condition for which the misuse of antibiotics is common and is reported from different parts of the world. [6]

Nowadays, many paediatric physicians include antibiotics in their prescriptions without considering the rationality. Therefore an effective step should be taken to assess the effective use of antibiotics and probiotics in paediatric patients. Hence, the main aim of the study is to evaluate and assess the prescribing pattern of antibiotics and probiotics when used to manage diarrhoeal disease.

MATERIALS AND METHODS

The study was carried out in Paalana Institute of Medical Sciences Kannadi, Palakkad, Kerala, India. It is a tertiary care hospital with 300 bed facility. The study was conducted as a prospective study during June 2013 to November 2013. A total of 243 diarrhoea patients were enrolled in the study. The patients were selected on the basis of inclusion and exclusion criteria. Both inpatients and outpatients in paediatric department with diarrhoea and patients aged not more than 17 years were included. Patients aged above 17 years were excluded. The different parameters evaluated were age, sex socioeconomic factors, dietary habits, co-morbid condition of diarrhoea and physicians’ prescribing pattern.

Ethical Committee clearance was obtained (GCP/IEC/444/2013) from Grace College of Pharmacy, Palakkad and oral consent was obtained from all patients and facilities involved in the study.

RESULTS AND DISCUSSION

In this study most of the patients received antibiotic-probiotic combination (60.5%) for the treatment of diarrhoea. For 15.3% of patients received probiotics alone and antibiotics were prescribed for 24.3% of patients. The prevalence of diarrhoea is more common in males (62.1%) than in females (37.8%). The age group between 0–≤5 is more prevalent for paediatric diarrhoea. In this study mainly liquid dosage forms were used. Different liquid dosage form includes intravenous fluids, injection, reconstituted syrups and sachets were commonly prescribed and solid dosage forms like capsules and tablets are least prescribed.
Table 1.1 and figure 1.1 shows the gender wise prevalence of diarrhoea in paediatric patients. Among the 243 patients, 151 patients were male patients (62.1%) and 92 patients were female patients (37.8%).

<table>
<thead>
<tr>
<th>Gender</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>151</td>
<td>62.1</td>
</tr>
<tr>
<td>Female</td>
<td>92</td>
<td>37.8</td>
</tr>
<tr>
<td>Total</td>
<td>243</td>
<td>100</td>
</tr>
</tbody>
</table>

Fig. 1.2 represents the age group wise distribution of male and female patients among paediatric patients. The age group 0≤5 years accounted for the highest number 204 patients (male-53%, females-30.8%). The least number of patients were seen in the age group of 11≥17 years.

Fig. 1.3 shows that, out of the 243 patients, 147 patients were given antibiotics and probiotics as combination, 57 and 37 patients were given antibiotics and probiotics respectively. This shows a higher frequency of prescribing trend of combination of probiotics and antibiotics.
Fig. 1.4 represents the different probiotics which are most frequently prescribed in the hospital. They are *Saccharomyces boulardii*, *Lactic acid bacillus*, *Bacillus clausii*, Combination (*S. faecalis*, *C. butyricum*, *B. mesentericus* and *Lactic acid bacillus*), *S. bulardii + Lactic acid bacillus*, *S. bulardii + B. clausii* and *B. clausii + Lactic acid bacillus*. Among these, the most commonly prescribed probiotics was *Bacillus clausii* (male 25.5%, female 15.2%).

![Fig 1.4 Distribution of different probiotics](image)

Fig 1.5 shows the prescribing frequency of antibiotics among the population. Cephalosporins were the most commonly prescribed among the antibiotics, and were more prescribed among male population (28.94%). Among Cephalosporins, Ceftriaxone (IIIrd generation Cephalosporin) were mostly prescribed.

**Fig 1.5 Genderwise prevalence of Antibiotics prescribed**

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cephalosporins</td>
<td>15.43</td>
<td>28.94</td>
</tr>
<tr>
<td>Fluoroquinolone</td>
<td>14.15</td>
<td>19.94</td>
</tr>
<tr>
<td>Penicillin</td>
<td>0.00</td>
<td>0.64</td>
</tr>
<tr>
<td>Macrolide</td>
<td>0.32</td>
<td>1.61</td>
</tr>
<tr>
<td>Aminoglycoside</td>
<td>7.40</td>
<td>11.58</td>
</tr>
</tbody>
</table>

**CONCLUSION**

The result of the study revealed that high use of Cephalosporin class of drugs for the treatment of diarrhea in paediatric population and *Bacillus clausii* was the main probiotics that was prescribed by the paediatrician in the hospital. The study revealed that diarrhea is more prevalent in the age group of 0≤5. The study showed that for paediatric diarrhoea the current prescribing practice of physicians is a combination of antibiotic and probiotics. In future research can be conducted on specificity of probiotics in treating diarrhoea.

**ACKNOWLEDGMENT**

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