Antibiotic-Prescribing Practices of Primary Care Prescribers for Acute Diarrhea in New Delhi, India

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A B S T R A C T

Objective: To obtain information on the current prescribing rates of antibiotics in acute diarrhea in the community. **Methods:** Antibiotic use in acute diarrhea in the community (December 2007–November 2008) was surveyed by using patients' exit interviews at public and private facilities from four residential localities. Data were collected from 10 public sector facilities and 20 private clinics over 1 year. The percentage of patients receiving antibiotics and the prescribing pattern of antibiotics were analyzed by using the anatomical therapeutic chemical classification and the defined daily dose. **Results:** At public facilities 43% (171 of 398) and at private facilities 69% (76 of 110) of the patients with acute diarrhea were prescribed at least one antibiotic. Diarrhea increased during peak humid summer months, but doctors were fairly consistent in their antibiotic prescribing throughout the year. The main antibiotic class that was prescribed in both public and private sector facilities was fluoroquinolones, J01MA (91.5% and 96%, respectively). Pediatricians working in the private sector prescribed antibiotics to 51.5% (17 of 33) of children with diarrhea, whereas pediatricians working in the public sector prescribed antibiotics to 23% of children with acute diarrhea. At public facilities, the most commonly prescribed fluoroquinolone was norfloxacin, followed by ofloxacin and ciprofloxacin. At private clinics, it was ofloxacin followed by ciprofloxacin. **Conclusions:** This study clearly showed the irrational use of antibiotics for the treatment of acute diarrhea in children and adults that warrants interventional strategies.
Keywords: acute diarrhea, antibiotics, community, primary care, treatment guidelines.

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Introduction

The rapid emergence of antimicrobial resistance (AMR) in the community has become a major global health problem. It is estimated that 20% to 50% of all antibiotic use is inappropriate, resulting in an increased risk of side effects, higher costs, and higher rates of AMR in community pathogens [1–3]. An important inappropriate use of antibiotics is for viral or self-limiting infections. Here, we report the irrational use of antibiotics in acute diarrhea in the community. Viral pathogens such as rotavirus account for 70% to 80% of all diarrheal episodes [4]. In the majority of episodes of acute residential diarrhea, the cause usually remains unknown because of the self-limiting nature of the disease and the difficulty and delay in identifying the pathogen, and so the routine use of antimicrobials is not recommended [5]. The joint statement by the World Health Organization (WHO) and the United Nations International Children's Emergency Fund in 2004 recommended the use of low osmolarity oral rehydration solution (ORS) along with zinc for the treatment of acute diarrhea in children [6,7]. The Indian Academy of Paediatrics published guidelines for the management of acute diarrhea in 2004 [8], which were further revised in 2006 [9]. The guidelines focused on the use of low osmolarity ORS

and zinc. Antibiotic use is recommended only for acute bloody diarrhea/dysentery. As per local standard treatment guidelines also, antibiotics are not recommended for acute diarrhea in adults [10]. Unfortunately, diarrhea is a condition for which the misuse of antibiotics is common and is reported from different parts of the world [11–13]. Understanding the extent and pattern of antimicrobial use for acute diarrhea in the community is important for defining a regional intervention program to promote the rational use of antimicrobials and thus limit the spread of AMR and reduce the cost of therapy for acute diarrhea. Hence, this study was conducted in Delhi, India, to obtain information on the current prescribing rates of antibiotics in acute diarrhea in primary care settings in the community. In the absence of community-based databases on antibiotic use in developing countries, a methodology recently established for surveillance of antibiotic use at New Delhi by conducting "Exit Interviews" of the patients [14–16] was used. This study was conducted from December 2007 to November 2008. The primary aims of this study were 1) to find out the percentage of antibiotic prescriptions in acute diarrhea by primary health-care providers in public and private sectors and 2) to determine the pattern of antibiotic choice for diarrhea in public and private sectors.

Methods

This study was part of a larger study on surveillance of antibiotic use and resistance in the community, and data were collected from four residential localities (municipal wards) of New Delhi, India. The four areas were Rajinder Nagar, Patel Nagar, Karol Bagh, and Rajouri Garden.

Facility selection

To get a complete picture of antibiotic use in the community for acute diarrhea, both public and private sector facilities were surveyed.

1. Public sector: Eight dispensaries (primary health-care facility) and two hospitals (secondary care level) under the Government of National Capital Territory of Delhi were in the surveillance area of the study, and all the facilities were enrolled for the study.

Private clinics: 20 private sector general practitioners and specialists willing to cooperate for the study and practicing in the chosen areas—4 pediatricians, 3 physicians, and 13 general practitioners.

Data collection methodology: patients' exit interviews

Data on antibiotic use were collected by trained data collectors (pharmacists) who conducted exit interviews with patients leaving the facility [14]. The study was conducted at five private practitioners per month in the chosen areas. Five practitioners were randomly chosen every month from a pool of 20 practitioners enrolled for the study. All patients who were visiting the clinic after they came out from the prescriber's office were asked whether they had diarrhea for the last 1 to 2 days and no blood in the stool. Any patient with symptom of only acute diarrhea without blood in the stool was enrolled for the exit interview and his or her prescription was monitored.

A predesigned proforma was used to collect data regarding the name, dose, and duration of the antibiotic prescribed.

The total number of patients with symptoms of acute diarrhea at each facility during the time data collectors were in the facility was recorded at each visit. Data collectors' schedules were randomly prepared for the day and time (1 hour) of visits every month for data collection. Data collectors visited each public facility two times per facility every month and for private clinics three times every month to collect the data.

Outcome measures

The anatomical therapeutic chemical classification and the defined daily dose measurement units were assigned to the data [17]. Antibiotic use was measured in terms of the percentage of patients receiving an antibiotic. The denominator was the total number of diarrhea patients with and without an antibiotic attending the facilities during the time of data collection. Prescribing patterns for various antibiotics in public and private clinics were analyzed. Consumption of antibiotics was expressed as total number of defined daily doses per 1000 diarrhea patients attending the facilities.

Data management

All the data collected were entered into software developed in Visual Basic, SQL Server, and Crystal Reports. The same software was used to analyze the data.

Ethical approval

Ethical approval for the study was obtained from Vallabhbhai Patel Chest Institute, University of Delhi, India, and also from
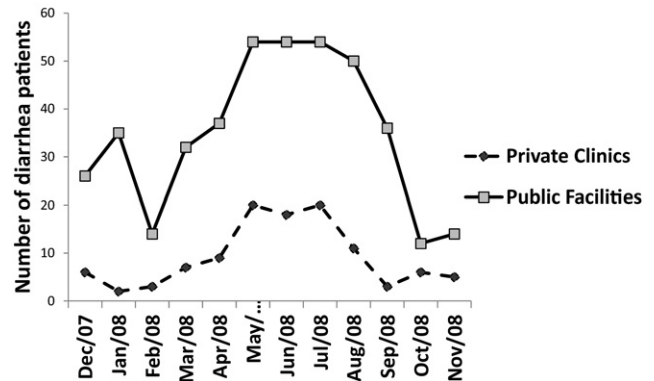
Fig. 1 – Number of diarrhea patients in public and private facilities over 1 year (December 2007–November 2008).

WHO Ethics Review Committee. Informed consent was obtained from all participants and facilities involved in the study.

Results

Total number of patients and seasonal pattern of acute diarrhea

Patients who had symptoms of only acute diarrhea and visited the enrolled public and private facilities during the study time were monitored. A total of 398 prescriptions from public facilities and a total of 110 prescriptions from private clinics were studied. A very clear seasonal variation in the number of patients with acute diarrhea was observed at both public and private facilities (Fig. 1). The number of diarrhea patients increased during peak summer humid months May, June, and July.

Percentage of antibiotic prescription

At public facilities, 43% of patients with acute diarrhea received at least one antibiotic, whereas at private clinics, overall 69% of the patients received any antibiotic for the treatment of acute diarrhea. Pediatricians of our study at private clinics prescribed antibiotics to 51.5% of children with acute diarrhea. These children were younger than 13 years. Subgroup analysis of public sector for age showed that 23% of children younger than 13 years were prescribed antibiotics for acute diarrhea. No seasonal difference in the percentage of patients receiving antibiotics for diarrhea treatment was noticed.

Pattern of antibiotic prescriptions for acute diarrhea

Doctors at both types of public facilities, that is, dispensaries (primary health-care center) and secondary care level hospitals (30- and 50-bed) prescribed antibiotics in the similar fashion. Of the total prescriptions with antibiotics, 89% and 94% of prescriptions, respectively, had a fluoroquinolone at dispensaries and at secondary care level hospital. At private facilities, of the total antibiotics prescribed, 96% of prescriptions had a fluoroquinolone and for pediatricians it was 100%.

Table 1 shows the members from each group of antibiotics prescribed and expressed as defined daily dose per 1000 patients for acute diarrhea. At public sector facilities, norfloxacin was the most prescribed fluoroquinolone followed by ofloxacin and ciprofloxacin, whereas at private sector facilities, ofloxacin was the main member followed by norfloxacin. At private clinics, a few patients also received a combination of ciprofloxacin or norfloxacin with tinidazole.