Clinical Brief

Factors Affecting Antibiotic Prescribing Pattern in Pediatric Practice

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Abstract. To determine the proportion of children receiving antibiotics for common illnesses and to understand the antibiotic prescription ptern and factors influencing it , a cross sectional study was done among the private practitioners in Chennai, India 403 prescriptions by 40 physicians from selected health facilities were analyzed 79.9% of children with ARI (Acuite respiratory infection) and ADD (Acute watery diarrhea) were prescribed antibiotics. Penicillins (43.9%) were the commonest antibiotic prescribed. Factors like postgraduate qualification, experience of physician, source and method of updating knowledge, inpatient practice setting and presence of fever influenced the antibiotic prescription.
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Acute respiratory infection (ARI), acute watery diarrhea (ADD) and viral fever are the common childhood illnesses accounting for the major proportion of pediatric outpatient visits. Only a small proportion of these patients (<20%) require antibiotic therapy.[1] Studies have shown that there is an inappropriate use of antibiotics, especially the broad-spectrum antibiotics, for these common childhood illnesses, which has contributed largely to the development of antibiotic resistance. Antonio da Cunha *et al* in Brazil showed that 28% of the antibiotic prescriptions for children with ARI were inappropriate.[2] Arch G Mainous *at al* showed that the use of broad-spectrum antibiotics has increased from 10.6% to 40.6% for bronchitis in a span of 6 years from 1993 to 1999.[3] Inappropriate use of antibiotics is common throughout the country, but the extent of the problem and factors influencing would vary greatly between different regions. This study focuses on Chennai city with the objectives of:

- Determining the proportion of children with common childhood illnesses receiving antibiotics
- Studying the antibiotic prescription pattern for the above illnesses in a primary care setting
- Determining the factors related to antibiotic prescription pattern

MATERIALS AND METHODS

A cross-sectional study was conducted in private primary health care facilities in Chennai. Four facilities from each of the 10 health zones of Chennai Corporation were selected randomly, and in each facility either a pediatrician or a general physician having more than 40% of his OPD strength as pediatric patients was enrolled for the study. The first 10 consecutive prescriptions from the physician were analyzed after obtaining the consent of the physician. The sample size was calculated using cluster design method, prescriptions from one physician forming one cluster. For an expected antibiotic prescription rate of 54%, the sample size was estimated as 400 prescriptions, and 40 clusters were studied. Patients in 1 – 12 yr age-group with symptoms (less than 7 days duration) of running nose or blocked nose, cough, sore throat, diarrhea and fever without any other localizing symptoms were enrolled in the study. Children treated for similar illness in the past 30 days or presently on antibiotics for other illness were excluded from the study. Seriously ill children requiring in-patient care were not enrolled in the study. The main outcome measures were the rate of antibiotic prescription and the pattern of antibiotic prescribed. The data analysis was done using SPSS 11.5 software.

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RESULTS

Of the 40 physicians, 22 had undergraduate qualification and 18 had pediatric postgraduate qualification. 403 prescriptions were collected from the OPD of these physicians along with patient details in the patient data form. Physician details were recorded in a separate structured questionnaire.

Proportion and Pattern of Antibiotic Prescription

Among the 403 children with common childhood illnesses, 321 (79.4%) were prescribed antibiotics. 96.95% of children having ARI with fever and 100% of children

TABLE 1. Factors Influencing Antibiotic Prescription

Factors influencing antibiotic prescription		Antibiotics given (95% CI)	P value
Educational qualification of the physician	Only UG degree	213 (95.5%)	0.001*
	Pediatric PG degree	109 (60.5%)	(6.61 – 29.89)
Experience of the physician	< 20 years	198 (88.7%)	0.001*
	> 20 years	124 (44.2%)	(2.06–6.24)
Source of updating knowledge	Academic methods	111 (61.6%)	0.001*
	Pharmaceuticals' information	211 (94.6%)	(5.47–22.27)
Practice setting	Only OPD	282 (84.4%)	0.001*
	BOTH IP and OPD	40 (57.9%)	(216–7.16)
Patient volume	< 40 per day	245 (81.1%)	
	> 40 per day	77 (76.2%)	0.28
Age of the child	< 5 yrs	160 (77.6%)	
	> 5 yrs	162 (82.2%)	0.35

*p value – statistically significnt

having diarrhea with fever received antibiotics. Thus, presence of fever is considered a significant factor for prescribing antibiotics. Penicillin group of antibiotics were the commonly prescribed antibiotic. Second and third generation Cephalosporins were used in 4.9% of patients.

Factors Related To Antibiotic Prescription

Factors, both physician and practice related, influencing the antibiotic prescription were analyzed and the results are as formulated in table 1. Physicians with a pediatric postgraduate qualification and physicians with more than 20 years of experience are less likely to prescribe antibiotics, as are physicians who update their knowledge through academic means like CMEs, seminars, journals etc. Physicians with only outpatient practice are more likely to prescribe antibiotics. Neither the volume of the patient seen per day nor the age of the child had any significant influence over the likelihood of antibiotic prescription (Table 1).

DISCUSSION

The emerging problem of antibiotic resistance has become a major threat to the medical field. Excessive and inappropriate use of antibiotics has been a major contributor to this ever-growing problem. The majority of common childhood illnesses are caused by viruses which do not require antibiotics. The proportion of antibiotic prescription was 79.4% in the present study as against the WHO recommendation[1] of 20% antibiotic use for these common childhood illnesses. Penicillins were the commonest antibiotic prescribed (42.9%), among which amoxicillin was the most frequently prescribed of all. In children with diarrhea and fever, Fluoroquinolones were commonly prescribed showing the misuse of antibiotics not meant for primary care.

In the present study, if was found that the presence of fever increased the likelihood of antibiotic being prescribed. This is largely due to the fact that the practicing physicians tend to consider fever as a sign of bacterial infection, which is not the case always. We found that there was more rational prescription of antibiotics by physicians holding a pediatric postgraduate qualification and also by physicians with experience of more than 20 years. Physicians who updated their knowledge through academic methods were less likely to prescribe antibiotics when compared to those depending on the information provided by the pharmaceuticals. This is primarily due to the bias caused by the pharmaceuticals promoting their products.

The present study showed that physicians having only outpatient practice were more likely to prescribe antibiotics than those with both inpatient and outpatient practices. This is because the physicians with inpatient facilities had relatively better exposure to specific guidelines and protocols for antibiotic prescription. The volume of the patient seen per day and the age of the child did not have significant influence over the antibiotic prescription pattern in our study clearly showing the fact that the prescription was largely based on the beliefs, knowledge and experience of the physician rather than on the workload in the practice setting.

CONCLUSION

It is high time that the professional bodies should take up the project of increasing awareness about antibiotic use among the practicing physicians to dispel the inappropriate information caused by pharmaceuticals and initiate necessary steps to deliver the latest advances of the knowledge to every practicing physician through

academic activities in order to check over this emerging problem of antibiotic resistance.

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