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Prescribing Practices of Antibiotics in ARI Under the Age of Five and Factors Influencing Prescribing Antibiotics

Khalid K*, Ahmadullah H, Iqbal J, Salam AA, Waqar A

Faculty of Pharmacy, Federal Urdu University, Karachi, Pakistan.

ABSTRACT

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Background & Objective: This study was conducted to describe and obtain the baseline data about the irrational use of antibiotics in children under the age of five with Acute Respiratory Infection (ARI). **Methodology:** A cross sectional study was conducted in about 25 general and pediatric clinics in Karachi, Pakistan. A total of 500 prescriptions were collected and analyzed using quantitative technique. **Results:** Overall results revealed that 100% of patients of ARI were treated with antibiotics by Consultants and General practitioners. It confirms that the quality of prescribing antibacterial agents in ARI in children is inadequate. The major classes of antibiotics used were Penicillin 24%, Macrolide 32%, Second Generation Cephalosporins 20%, and Third Generation Cephalosporins 24%. Regarding qualification of Prescribers MBBS, Consultants and Paramedics were 70%, 10%, and 20% respectively. The study also reflects the immediate urgency to develop an independent mechanism for practitioners to ensure that the patient gets proper evidence-based treatment. **Conclusion:** This study indicates irrational prescribing practices in ARIs in children under the age of five, so there is an immediate need of educational intervention along with several follow ups, in collaboration with national and international health care organizations in order to improve the practice to be rational especially using antibiotic in children under age of 5 years, which some time cause untoward effects and these toxic effects would be incurable especially in ARI.

Keywords: Irrational drug use, Antibiotics, Children, Cross-sectional Study.

INTRODUCTION

ARI have two major differentiations i.e. upper respiratory tract infections (URTIs) and lower respiratory tract infections (LRTIs). URTIs are the most common infectious diseases which include rhinitis, sinusitis, ear infections, acute pharyngitis or tonsillopharyngitis, epiglottises, and laryngitis of which ear infections and pharyngitis causes the more severe complications. The common LRTIs in children are pneumonia and bronchiolitis. Because most URTIs are self-limiting, their complications are more important than the infections. Acute viral infections predispose children to bacterial infections of the sinuses and middle ear, and aspiration of infected secretions and cells can result in LRTIs.[1] The major percentage of children's outpatient visits is due to acute watery diarrhea, acute respiratory infection, and viral fever and in these diseases there is some cases which require antibiotic therapy (<20%). It is proven that inappropriate use of antibiotics specifically the broad spectrum in the stated common diseases results in resistance to antibiotics.[2] It is an established research work that the treatment of upper respiratory infection has nothing to do with the use of antibiotics, but unfortunately a large proportion (38%) of children diagnosed with such infections are continuously treated with different antibiotic regimens. The common use of antibiotics is the prime reason for the spread of drug resistant bacterial strains which not only results in costly treatments, but high rate of mortality also.[3] The key element of high quality primary care is the appropriate use of prescribed drugs by community based physicians. Due to changing and fast growing global therapeutics, different latest ways provided to convey precise and significant information to physicians.[4] The impact of medical education on subsequent prescribing behavior is difficult to evaluate, as most studies have measured knowledge rather than actual performance.[5] Proper, reasonable, and applicable measurements of clinical practice are the only basis for assessment of quality care.[6] Different studies analyzed the prescribing practice data in the United Kingdom (UK) and the United States of America (USA) which described the complex schedule of physicians as main reason of antibiotic prescribing.[7] Irrational prescribing is a worldwide problem. Numerous studies, both from developed and developing countries, describe a pattern that includes poly pharmacy, the utilization of medicines that are not related to the process of diagnosis or unnecessarily expensive, the inappropriate or overuse of antibiotics and irrational self-medication with drugs frequently taken in under dose. The problem is exacerbated by large proportion of drugs being purchased without any prescription at all.[8]

It is an established fact that contagious and infectious diseases are more dangerous and still take life of large number of people than either cancer or cardiovascular diseases, but over the past decades, physicians working in developed countries have reported a prominent and noticeable reduction in

Address for Correspondence:
Khalid Khan, Faculty of Pharmacy, Hamdard University, Karachi, Pakistan
E-Mail: dr_khalid_khan@yahoo.com

mortality from these diseases and all this decline is due to the proper use of antibiotics. In study carried out in Sweden, it is showed that death rates declined at a faster rate in septicemia, syphilis and non-meningococcal meningitis after the introduction and application of antibiotics.[9] A possible solution to overcome the particular problem can be reduced by increasing diagnostic approaches. This will also help the physician to avoid the pressure of patient about demanding antibiotics, when there is a negative result of test in hand. In addition, if the condition of patient is not good and he needs treatment frequently, the result of test should help in selecting the most suitable agent.[9]

METHODOLOGY

Study Design & Population:

A cross-sectional descriptive study was conducted in 25 general and pediatric clinics of Karachi (Pakistan), in the period of 4 months. Clinics were selected on the basis of patient population visited. Total of 500 prescriptions were collected and data was analyzed by using quantitative and qualitative tools.

Inclusion & Exclusion Criteria:

- Patients with the diagnosis of ARI were included.
- Both male and female pediatric patients under the age of five years.
- Children with other infections like gastro intestinal infections were excluded.

Data Collection:

Qualitative data was collected by taking interviews from different prescribers. The interview was designed after consulting guidelines given in WHO guidelines in rational drug use module i.e. it was designed to obtain essential information about the daily prescribing practice. Qualitative data was obtained by meeting with the physicians and general practitioners, and taking a simple interview on the basis of a designed paper, comprising some questions having the title of "interview guide for the prescribers".

Quantitative data collection was in the form of collecting prescriptions. As the survey is related to less than five years age children, so the ultimate person of concern was parents of children especially mother.

In clinical practice (in this particular locality) there were two specific times in which majority of patient's visits their doctors i.e. in morning (from 9:00am to 12:00pm) and afternoon (4:00pm to 7:00pm), so most of collections were took place in these times. In some clinics it may happen to visit it twice or thrice for getting just a single particular prescription.

Ethical Approval:

This project involved patients data so reviewed and approved by Research Ethics Board prior to start.

Statistical Analysis:

Data (in form of prescriptions and history of patients), were studied and subjected to descriptive statistical analysis using Microsoft Excel 2007 to get the required information.

RESULTS

A total of 500 prescriptions were collected from different clinics in order to evaluate different parameters of prescribing practices of antibiotics in ARI. The primary cause of ARI was found to be viral i.e. 65%, while 25% were bacterial and rest of 10% were caused by allergens (Fig. 1). the prescribed drug were antibiotics, antitussives, antihistamines, NSAIDs, and bronchodilators in which antibiotics were 100%, NSAIDs were 80%, bronchodilators were 56%, antihistamines were 28% and antitussives were 18% prescribed (Fig. 2).

From quantitative data, different prescribed combination of drugs in ARI were evaluated which were; Antibiotic+Bronchodilator+NSAIDs; 42%, Antibiotic+Antihistamines+NSAIDs; 20%, and Antibiotic+Antitussives+NSAIDs; 16% of prescriptions as shown in (Fig. 3).

Fig. 1: Graph showing Etiology of Infection.

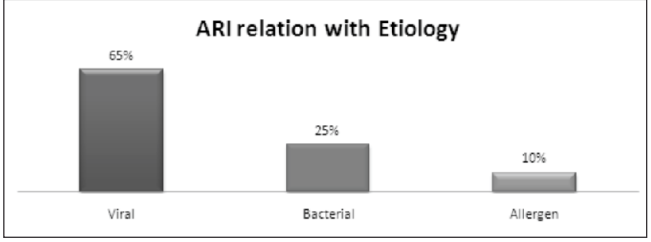


Fig. 2: Graph showing Ratio of Medicine Prescribed.

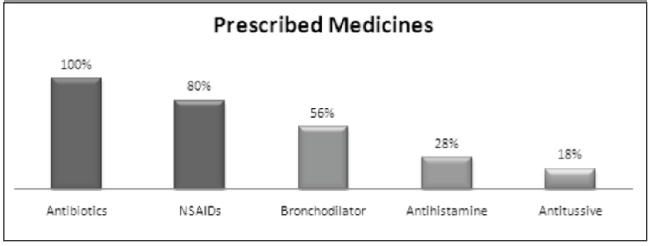
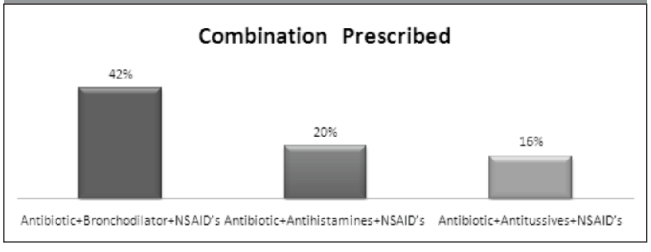


Fig. 3: Graph showing Classes of Medicine prescribed.



Among the different classes of antibiotics; Penicillin (co-amoxiclav) was 24%, Macrolides (Clarithromycin) was 32%, Second generation cephalosporins (Cefaclor) was 20%, and Third generations of Cephalosporins (Cefixime) was 24% used (Fig. 4a & 4b).

Among the prescribers qualification, 70% were MBBS, 10% were Consultants and 20% were Paramedics as shown in (Fig.7). Factors which were influencing antibiotic prescribing among practitioners were described in (Table. 1) in which only 16.6%% of practitioners were following the practice WHO guidelines.

DISCUSSION

From analyzing quantitative data, it becomes obvious that virus is responsible for 65% of ARI (Fig. 1). This finding is nearly similar as publicized by Sheefat et, al.[10] Surprisingly all of the prescriptions contain at least one antibiotic although antibiotics are in-effective in viral infections but it is claimed by the practitioners that they were prescribing antibiotics in order to avoid secondary infections, community trend and sometimes improper diagnosis. This shows that the prescribing behavior of prescriber is non-serious and most of them have inadequate competency in the diagnosis of ARIs, which results in loss of limited resources and development of bacterial resistance against the potent antibiotics.[11] The qualifications of the practicing prescribers were investigated and it is found that most of them were MBBS (70%). Paramedics who were trained to handle the emergencies were also practicing in 20% of the clinics. Doctors having qualification greater than MBBS (Consultants) were only 10% shown in (Fig. 5).Being a paramedic, who don't know about the pathological and physiological basis of disease and the pharmacological properties of the respected medicines, and still prescribing medicine especially antibiotics can harm children and also result in the loss of limited resources in an under developed country like Pakistan.

Multiple factors which influence on antibiotic prescribing are shown in (Table. 1). Perceived pressure from parents was identified by prescribers as a major factor in antibiotic prescribing in this study.[12] Factors like pharmaceutical dealing (6.66 %) and fear of loses OPD weight age (1.66 %) also results in inappropriate prescribing of antibiotics.

Then drugs are used properly they are the most efficient and economical forms of treatment while the inappropriate use not only results in wasting the health resources but also cause harmful effects to the patients. Medicinal treatment is the most active field of change in medicine therefore industrialist spent large amount of money for the development and implementation of novel drugs.[4]

Table 1: Factors influencing antibiotic prescribing among practitioners. (N=25)

Factors%	Reporting
Consultant Inspired	13.3
Previous Experience	20
Practice guide lines	16.6
Community Practice Trend	5.3
Cost of Medication	8.3
Parents demand (for quick recovery)	21.7
Maintaining OPD weightage (fear of losing patient)	1.66
Pharmaceutical dealing (doctors discount)	6.66
Condition of patient (severity of symptoms)	6.66

Fig. 4a: Graph showing Classes of Antibiotics prescribed.

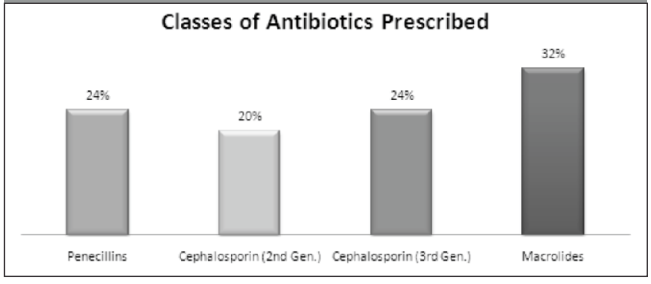


Fig. 4 b: Graph showing Generics of Antibiotics prescribed.

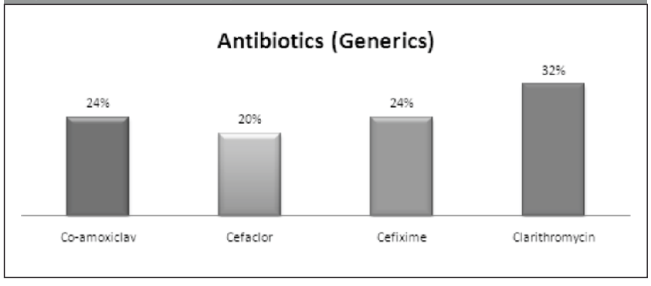
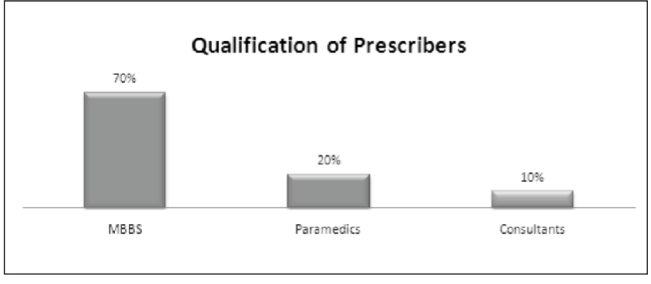


Fig. 5: Graph showing Qualification of Prescribers.



CONCLUSION

The result of this study indicates irrational prescribing practices in ARIs in children under the age of five, so there is an immediate need of educational intervention along with several follow-ups, in collaboration with national and international health care organizations in order to improve the

practice to be rational especially using antibiotic in children under age of 5 years, which some time cause untoward effects and these toxic effects would be incurable especially in ARI.

Finally, our study showed suboptimal and irrational practices of ARIs in different clinics. Usually the cross-sectional comparative studies were carried out in a short period of time i.e. just three months and we sure that if longitudinal type of studies carried out in collaboration of governmental organizations or with NGO's better results can be obtained.

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