ORIGINAL ARTICLE

# KNOWLEDGE, ATTITUDES AND PRACTICES OF PARENTS REGARDING ANTIBIOTIC USE IN CHILDREN

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**Background:** Emerging resistance to antimicrobial chemotherapy is becoming a challenge for medicine in recent times. Un-prescribed use of antibiotics is a major contributor to development of this problem. In Pakistan access to antibiotics remains unchecked and hence results in it are over use. The aim of this study was to assess knowledge of parents regarding use of antibiotics, its associated problems, their source of information and their expectations from Paediatricians for prescription of anti-biotics. **Methods:** This is a questionnaire based cross sectional study conducted in Hayatabad town, District Peshawar. Parents who were consenting, had children aged between 0–16 years, and were not related to medical profession were included in study. Total number of participants interviewed was 400. Analysis was done using prevalence ratios. **Results:** Most of the participants were mothers. Majority of respondents were literate with education up till level of Graduation. 64% mentioned that they enjoyed a good access to healthcare. Most common source for use of antibiotics was Physician. 35% mentioned that antibiotics must be administered in any case of fever, 47% thought antibiotics to increase recovery time and 51% knew that antibiotics have their own side effect. The most common reason to administer un-prescribed antibiotics was same antibiotic being prescribed by a physician earlier followed by family member or pharmacist recommending use of antibiotic. Lack of resources was denied as a reason for self-administration of antibiotics by majority of parents. **Conclusion:** There is a need of intervention to increase awareness regarding judicious use of antibiotics and to check un-prescribed dispensing of antibiotics.

**Keywords:** Parents, antibiotics, respiratory tract infections, prescription, resistance, knowledge, attitude, practices

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## INTRODUCTION

The discovery of penicillin heralded the era of antibiotics. They proved to be immensely useful in treating infectious diseases but soon clinical failures due to antibiotic resistance also started emerging.[1,2] This necessitated the development of new classes of antibiotics. The war between the antibiotics and bacteria started and it showed an all familiar trend with the introduction of every new class of antibiotics. After an initial setback, the bacteria used evolutionary pressures and natural selection to develop different modes of resistance and thus emerge victorious. The extensive use of antibiotics has led to spread of resistant strains of bacteria. This trend continues unabated and has reached alarming proportions with the emergence of the 'super-bugs' containing New Delhi metallo-β-lactamase-1 (NDM-1) gene. This trend of resistance has been aptly described by A. Ghafur: "The art of war is deception; that is deceiving the enemy. But in the war against microbes we have deceived ourselves by misusing, under using and overusing antibiotics".[3]

There is sufficient evidence to conclude that antibiotic misuse is correlated with increasing bacterial resistance.[4] For example, it has been shown that recent antibiotic use increases the risk of nasopharyngeal carriage of penicillin-resistant pneumococcus.[5,6] The inappropriate use of antibiotics has been well-documented in both developed and developing countries.[7] The comparatively less regulation and weak implementation of health policy in the developing world has led to persistence of such practices thus increasing bacterial resistance.[8] A recent example implicating the Indian subcontinent is the discovery of NDM-1 gene plasmids conferring resistance to gram-negative bacteria and its potential to be a worldwide public health problem.[9] The editorial by A. Ghafur draws our attention to the widespread nonprescription use of antibiotics in India, and postulates that the NDM-1 problem is likely to further worsen in the future.[3,9]

In the developing world acute respiratory infections (ARI) are a major cause of childhood mortality. For example, in Pakistan ARI in children under-five, are responsible for more than one-quarter of deaths in the community and one-third of deaths occurring in hospitals.[10] Among other factors contributing to complications and mortality due to ARI, the inappropriate use of antibiotics for treatment of ARI has also been implicated. A review done by

Thaver *et. al.* of studies from developing countries shows alarming rates of resistance to ampicillin and gentamicin, the first-line antimicrobial agents recommended by WHO for treatment of serious community-acquired infections (including sepsis, pneumonia, and meningitis) in young infants. Cotrimoxazole (TMP-SMX) is used extensively in pneumonia control programs in developing world.[11] Widespread resistance to TMP-SMX is now common in community isolates of E.coli (78%) and Klebsiella (45%).[11] In the developing world, resistance to antimicrobial drugs is causing increasing mortality and morbidity from infectious diseases like pneumococcal meningitis, tuberculosis, and typhoid fever.[8] Antibiotic resistance also inflicts a heavy toll on the health economy.[4]

In a pediatric setting, upper respiratory infections are one of the major reasons for prescribing antibiotics. Most of these infections are viral in nature and only less than 5% are complicated by bacterial infections. Viral infections do not require antibiotics. Therefore the judicious use of antibiotics needs to be stressed. In this respect the better and continued education of doctors is essential. Physicians need to be cognizant of the broader consequences of indiscriminately prescribing antibiotics. On the other hand the public also needs to be educated on this matter. A number of studies have been done to investigate the prescribing practices of physicians.[2,10,12–14] Some of the reasons for inappropriate antibiotic use identified are social reasons.[1] Commonly implicated is the fear of losing clientage and meeting the expectations of parents. Parents often request an antibiotic where none is needed or request a different antibiotic than the one physician was going to prescribe and sometimes physicians tend to accept their request.[12,14–16] Parents also sometimes administer antibiotics to their children without the knowledge of the physician. Parents have misconceptions regarding the role of antibiotics and which diseases require antibiotic therapy. They also need to be educated about the adverse effects of these drugs.

Different studies have focused more on the prescribing practices of physicians. The beliefs, practices and knowledge of parents regarding antibiotics are also an important area and needs to be thoroughly evaluated. In order to tackle the menace of drug-resistance, apart from refreshing physician's knowledge, public awareness is vital. By conducting a study on the knowledge, attributes and practices of parents, pertinent points can be identified so that the education of parents can be done in a targeted manner. This may help to improve the parents' attitudes towards antibiotic use and play a vital role in curbing the misuse of antibiotics.

## MATERIAL AND METHODS

This study was conducted on general population living in area of Hayatabad town, District Peshawar. The participants were parents who were consenting and had children in Paediatric age group, i.e., (from birth to16 years of age). Parents who were somehow related to medical profession were excluded from study. This is a questionnaire based cross sectional study. Sample size was calculated using Open Epi. Assuming a 50% knowledge about antibiotics (as no prior studies have been conducted on the mentioned study population), a confidence level of 95% and keeping bound of error to be 5% we obtain a provisional sample size of 384 subjects. A total of 400 parents were hence interviewed. Study participants meeting the selection criteria were selected by convenient sampling. SPSS-17 was used for data analysis. Statistical analysis was mainly done using prevalence ratios. A written informed consent was obtained from each participant prior to administering questionnaire. The participants had the right not to answer any part of the questionnaire. The participants were not offered any benefits or incentives. This study posed no risks to participants.

## RESULTS

Total number of parents interviewed was 400 which comprised of 250 (62.5%) mothers and 150 (37.5%) fathers. The age distribution of respondents comprised of 270 parents being less than 40 years in age and 130 being more than 40 years in age. Distribution of respondents according to literacy level was as; 100 (25%) up to Grade 10 or high school, 109 (27.3%) up to Graduation, 134 (33.5%) up to Post-graduation while 57 (14.3%) reported to be illiterate. Majority (53%) reported their family income to be moderate. 64% of respondents mentioned that they enjoyed a good access to healthcare while 10.5% reported a poor access to healthcare facilities. 92.5% of respondents had experienced their child suffering from Acute Respiratory Infection. Most common sources for information about use of antibiotics were Physician (58.9%), followed in order by friends & Family (27.2%) (Figure-1).

There was very little difference in percentage of respondents that disagreed with notion that Antibiotics must be administered in any case of fever (39.3%) as compared to those who agreed to this statement (35.5%) while 25.3% were uncertain. Similarly 31.3% mentioned that antibiotics were always necessary in ARI and 43.8% were uncertain to the query. A vast majority (47.3%) thought that Antibiotics increased recovery time and 51.8%

agreed that antibiotics have their own side effects (Table-1).

Most of the parents (53%) took their child to pediatrician in less than 3 days after start of symptoms of ARI. Most common symptoms to visit pediatrician included cough (23.4%), followed by ear pain (18.1%) and nasal discharge (12.9%). Majority of parents expected the pediatrician to prescribe antibiotics for sore throat, cough, and fever and ear pain. However symptoms for which parents never expected their paediatrician to prescribe antibiotics were cold (29.3%) and nasal discharge (32.8%) (Figure-2).

The most common reason to administer un-prescribed antibiotics was that the same antibiotic was prescribed by physician earlier followed by family member or pharmacist recommending use of antibiotic. Lack of resources was rejected as a reason of self-administration of antibiotics by majority of parents.

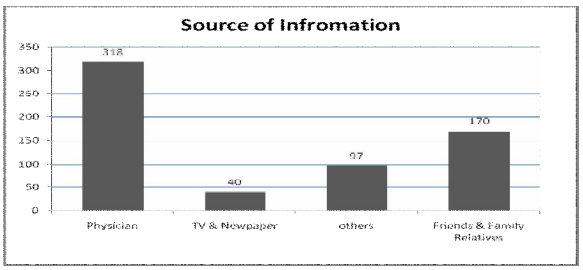


**Figure-1: Source of information regarding antibiotics**

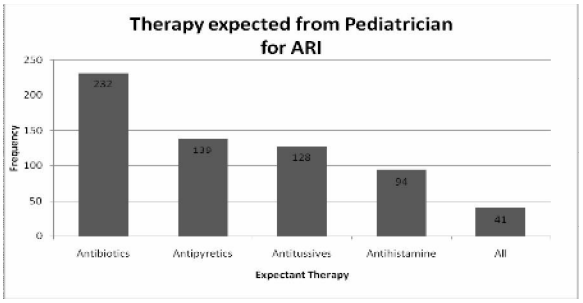


**Figure-2: Therapy expected by paediatrician for acute respiratory infection**

**Table-1: Important queries to assess knowledge of parents**

| Query | Agree | Disagree | Uncertain |
|---|---|---|---|
| **Antibiotics must always be administered in case of Fever** | 142 (35.5%) | 157 (39.3%) | 101 (25.3%) |
| **As Most ARI are of Viral origin, Antibiotics must not be administered** | 125 (31.3%) | 100 (25%) | 175 (43.8%) |
| **Antibiotics increase recovery time** | 189 (47.3%) | 99 (24.8%) | 112 (28%) |
| **Antibiotics do not have side effects** | 104 (26%) | 207 (51.8%) | 89 (22.3%) |

## DISCUSSION

Majority of respondents had age group to have kids in Paediatric age group. As this study was mainly conducted in an upscale urban settlement majority of respondents had moderate to high family income and enjoyed good access to healthcare. This population mainly represented middle to high socioeconomic class and hence created a bias as results of this study cannot be generalized. However it provides a good insight to the problem as this population due to its better literacy level is the one most prone to the problem of self-administration of antibiotics.[4]

The fact that majority of parents admitted to self-administration of antibiotics demonstrates a lack of knowledge regarding its consequences. Majority of parents took their child to paediatrician in less than 3 days of onset of symptoms. As by this time complications like super added infections or development of Otitis media are have not occurs usually and hence may lead to overuse of antibiotics.[1] Similarly there is lack of follow up practice by parents, provoking the physician to empirically start antibiotics. As demonstrated in results majority of parents wanted physician to prescribe antibiotics as well.[12,14–17]

Majority of parents correctly described cough and ear pain as conditions requiring antibiotics as they may represent a developing pneumonia or Otitis media, both being serious conditions that require antibiotics.

Most common reason described for self-administration of antibiotics were mentioned to be a physician previously prescribing same antibiotic and advice by family member or pharmacy personnel.[7,13] This fact points to the problem of dispensing antibiotics without prescriptions by pharmacies making them accessible to everyone. This currently poses a major public health problem requiring attention of authorities to enforce regulation in order to curb this practice.[8,9]

## CONCLUSION

Majority of parents admitted to self-administration of antibiotics. There is a need of intervention to increase awareness regarding judicious use of antibiotics and to check un-prescribed dispensing of antibiotics.

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