Use of Antibiotics in Upper Respiratory Tract Infections in Tertiary Care Teaching Hospital of Delhi

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INTRODUCTION:
The rise in antibiotic resistance has become an increasing public health concern worldwide. In developing countries like India, recent hospital and some community based data showed increase in burden of antimicrobial resistance.

The impact of antibiotic resistance includes increased morbidity and mortality from antibiotic-resistant infections, increased socioeconomic burden and greater healthcare costs. Poor antibiotic stewardship is a key driver of antibiotic resistance. One of the most common causes of visit to physician is Upper respiratory tract infections (URTI). These infections are often considered to be of little value from a standpoint of mortality but these infections are responsible for limited activity and absence from work and school in the general population of nation mainly in a developing country like India, when compared it with other infections.

URTI are commonly caused by the viruses, common viruses which are responsible are rhinovirus, parainfluenza virus, respiratory syncytial virus, influenza virus, coronavirus, coxsackievirus, adenovirus. URTI are caused by an acute infection which affect the upper respiratory tract including the nose, sinuses, pharynx or larynx and causes common cold, sinusitis, otitis media, tonsillitis, pharyngitis, laryngitis. As mentioned above, viruses are the most common causes of URTI and thus it requires only symptomatic treatment. To thin the respiratory secretions, it is usually advised to use frictional and antihistamines for cough or sore throat; decongestants and antihistamines for runny or stuffy nose. Many studies suggest that the antibiotics are not required, but almost 75% of adults with URTIs are given antibiotics by their consulting doctor.

A substantial proportion of all antibiotics are prescribed in the community, and URTI are one of the commonest...
conditions in the primary care setting for which antibiotic prescriptions have been reported to be high worldwide.\textsuperscript{15-17} The decision to prescribe antibiotics is intricate and involves number of factors. Apart from clinical factors, others like patient, provider and community characteristics, regulatory practices, cultural influences do play a role.\textsuperscript{18}

However, current evidence-based guidelines do not support antibiotic use in the majority of URTI cases,\textsuperscript{19, 20} as URTIs are frequently of viral etiology\textsuperscript{21-23} and are often self-limiting\textsuperscript{24, 25}, and seldom lead to serious complications.\textsuperscript{26} Inappropriate expectations of antibiotics by patients have been commonly observed in primary healthcare, and is a key factor driving over-prescription of antibiotics in such settings. A study found that physicians are more likely to prescribe antibiotics to patients who desire antibiotics.\textsuperscript{27} Furthermore, another study observed that various inappropriate behaviours by patients often pressured physicians to prescribe antibiotics,\textsuperscript{20} such as direct request for antibiotics, portraying severity of illness, or volunteering previous positive experience with use of antibiotics and it is also observed in study that primary healthcare physicians over-prescribe antibiotics in order to satisfy their patients.\textsuperscript{28} These studies underscore how patient’s expectations for antibiotics influence prescriptions by physicians.

By creating awareness and preventing the irrational prescription we can increase the effectiveness of the drugs and thus decreasing the morbidity associated with URTI. The objective of present study is to focus on the trends in the prescription pattern of antibiotics in URTI and to monitor adverse drug reaction associated with the use of these antibiotics.

**MATERIALS AND METHOD:**

Study was carried out in the medicine OPD/IPD patient in Hakeem Abdul Hameed (HAHC) Hospital associated with Hamdard Institute of Medical science and Research (HIMSR) Hamdard. It was a prospective, cross sectional, non-interventional, qualitative drug utilization evaluation of antibiotics utilized in URTI patients. Total 103 URTI patients, including 51 males and 52 females were enrolled according to the inclusion criteria. This research was carried out in accordance with the Basic Principles defined in ICH ‘Guidance for good clinical Practice’ and the principles enunciated in Declaration of Helsinki (Edinburgh, October 2000).

**RESULTS**

A total of 103 patients of URTIs were studied for patient demographics, prescribing pattern and adverse drug reactions.

**Demographic Details of the Patients**

**Gender Distribution of Patients with URTI**

Among the total of 103 patients, 51 (49.2\%) were male patients with the mean age of 35.25 years ± 11.26 and 52 (50.8\%) were female patients with the mean age of 35.19 years ± 8.96.

| GENDER   | No of Patients | Percentage (%) |
|----------|----------------|----------------|
| MALE     | 51             | 49.2           |
| FEMALE   | 52             | 50.8           |
| TOTAL    | 103            | 100            |

**Distribution of Patients with URTI according to Different Age Group**

Among the total of 103 patients enrolled approximately 40\% of the patients were from the age group of 20-29 years and above, 27\% of patients were in the age group of 30 – 39 years, 12\% of patients were in the age group of 40 – 49 years, and 15\% of patients were in the age group of 50-59 years. So these four groups contributed almost 94\% of the total patients enrolled. This was followed by the patients of age group 60+ years that contributed almost 5\% of total patients. The number of elder patients diagnosed with URTI was very small, that is 1\%.

| S.No. | Age in Year | Male Patients (n=51) | Female Patients (n=52) | No. of Patient (n=103) |
|-------|-------------|----------------------|------------------------|------------------------|
|       |             | Total | %     | Total | %     | Total | %     |
| 1     | 20-29       | 22    | 20.9  | 20    | 19.4  | 42    | 40    |
| 2     | 30-39       | 12    | 11.4  | 16    | 15.2  | 28    | 26.6  |
| 3     | 40-49       | 06    | 5.7   | 06    | 5.7   | 12    | 11.4  |
| 4     | 50-59       | 08    | 7.6   | 07    | 6.6   | 15    | 14.3  |
| 5     | 60+         | 03    | 2.8   | 03    | 2.8   | 06    | 5.7   |
Comorbid Conditions

Out of total patients enrolled (n=103), 18 patients were observed with co-morbid conditions.

| Comorbid Conditions                  | Total (n=18) | Percentage |
|--------------------------------------|--------------|------------|
| Diabetes                             | 06           | 33         |
| Multiple Sclerosis                   | 01           | 5          |
| Thyroid Dysfunction                  | 07           | 38         |
| Leucoderma                           | 01           | 5          |
| Tuberculosis                         | 01           | 5          |
| Diarrhoea                            | 02           | 11         |

Drug Utilization

Drugs Utilized for Treatment of URTI

Out of 103, 47 patients (45.6%) were on Antibiotic Treatment and 56 patients (54.5%) were on Non-Antibiotics. Among total patients enrolled, highest number of patients were diagnosed with common cold (n=38), followed by Sinusitis (n=21). The number of patients with Pharyngitis (n=17) and Laryngitis (n=19) were almost equal. Least number of patients were diagnosed with Otitis Media (n=7).

| Type of URTI      | Number of Patients on Antibiotic treatment (45.6%) (n=47) | Number of patients on Non-Antibiotic treatment (54.4%) (n=56) | Total (n=103) | Percentage (%) Receiving Antibiotic |
|-------------------|----------------------------------------------------------|-------------------------------------------------------------|---------------|------------------------------------|
| Common Cold       | 04                                                       | 34                                                          | 38            | 10.5                               |
| Pharyngitis       | 13                                                       | 04                                                          | 17            | 76.47                              |
| Laryngitis        | 12                                                       | 07                                                          | 19            | 63.15                              |
| Otitis media      | 07                                                       | 00                                                          | 7             | 100                                |
| Sinusitis         | 11                                                       | 10                                                          | 21            | 52.38                              |

Figure 2: URTI among Different Age Groups

Figure 3: Treatment for different types URTI
Antibiotics prescribed for different types of URTI

Antibiotic were prescribed in 47 patients, that is (45.6%) of the total patient enrolled. The remaining 56 patients that is (54.4%) patients were on non-Antibiotic treatment. The most commonly prescribed antibiotic throughout the study was found to be Azithromycin (n=33) i.e. 70.3% of the total prescriptions. This was followed by combination of Amoxicillin and Clavulanic Acid which was prescribed to 14 patients i.e. 29.7% of the total Antibiotics prescribed.

| Type of URTI      | Antibiotics Prescribed | Number of Patients | Total Number of Patients on Antibiotic |
|-------------------|------------------------|--------------------|---------------------------------------|
| Common Cold       | Azithromycin           | 04                 | 04                                    |
| Pharyngitis       | Azithromycin           | 09                 | 13                                    |
|                   | Amoxicillin + Clavulanic Acid | 04              |                                        |
| Laryngitis        | Azithromycin           | 12                 | 12                                    |
| Otitis Media      | Amoxicillin + Clavulanic Acid | 07              |                                        |
| Sinusitis         | Amoxicillin + Clavulanic Acid | 03              | 11                                    |
|                   | Azithromycin           | 08                 |                                        |

Table 6: Antibiotics Prescribed for treatment of URTI

| Therapy                                    | Number of Patients | Percentage of Total Antibiotics Prescribed (n=47) |
|--------------------------------------------|--------------------|---------------------------------------------------|
| Azithromycin                               | 33                 | 70.3                                              |
| Combination of Amoxicillin + Clavulanic acid | 14                 | 29.7                                             |

Adverse Drug Reactions of Antibiotics

Out of 103 patients, 10 patients reported adverse drug reactions. Out of which 8 were on Azithromycin and 2 were on Amoxicillin Clavulanic acid.

The adverse drug reactions reported were as follows:

| Number of Patients | Antibiotic                  | Adverse Drug Reaction          |
|--------------------|-----------------------------|--------------------------------|
| 6                  | Azithromycin                | Diarrhea and Loose stools      |
| 2                  | Azithromycin                | Stomach Pain and Nausea, Vomiting |
| 2                  | Amoxicillin + Clavulanic Acid | Diarrhea                       |

CONCLUSION

1. The common causes of URTI at HAHC Hospital were Common cold, Sinusitis, followed by Pharyngitis, Laryngitis and Otitis Media.
2. The antibiotics prescription for URTI was found to be relatively low of 45.6%.
3. The most commonly prescribed antibiotic was Azithromycin followed by amoxicillin and clavulanic acid combination
4. The antibiotic prescriptions were in accordance with the clinical practice guidelines of Indian council of medical research.

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