**RESEARCH PAPER**

# USE OFANTIBIOTICS FOR PATIENTS PRESENTING WITH SYMPTOMS SUGGESTIVE OF UPPER RESPIRATORY TRACT INFECTIONS OF LESS THAN 3 DAYS TO AN OUTPATIENT DEPARTMENT OF A TERTIARY HOSPITAL IN SRI LANKA

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## Abstract

**Background:** Upper respiratory tract infections (URTIs) include common cold, pharyngitis, sinusitis, tracheobronchitis and influenza. URTIs are generally due to viral infections and do not require antibiotic treatment. But unnecessary use of antibiotics for URTIs is common all over the world.

**Objectives:** Objective of this study was to identify use of antibiotics for patients presenting with symptoms suggestive of URTI for less than 3 days to an outpatient department (OPD) of the Teaching Hospital, Karapitiya (THK), Sri Lanka.

**Methods:** Study was conducted as a cross sectional study using an interviewer administrated questionnaire.

**Results:** Total of 612 patients with symptoms suggestive of URIs for less than three days were included in the study, of which, 440 were prescribed antibiotics (71.90%). The most commonly used antibiotic was amoxicillin and the least commonly used antibiotic was co-amoxiclav. Percentages of antibiotic prescription were 65.1%, 76.1% and 71.4% for below 12 years, between 12 – 60 years and above 60 years age categories respectively. Patients with sore throat, hoarseness and myalgia received the highest percentage of antibiotics. Similar percentage of patients with symptoms for less than 24hrs as well as more than 48hrs were prescribed antibiotics.

**Conclusions:** Prescription of antibiotics in OPD of THK is considerable high for URIs. Rate of antibiotics prescription reported in this study is the highest rate compared to all other studies published on antibiotic prescription for URTI.

**Keywords:** Antibiotic use, Upper Respiratory Tract Infections, Sri Lanka



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## Introduction

Upper respiratory tract infections (URTIs) is a nonspecific term commonly referring to acute infections in the nasal passages, paranasal sinuses, pharynx, larynx, trachea and bronchi. Common cold, pharyngitis, sinusitis, tracheobronchitis and influenza are generally considered as URIs.

URIs are generally due to viral infections and do not require use of antibiotics. Unnecessary use of antibiotics for URTIs is common all over the world. In Poland, antibiotic therapy was ordered for 58 % of patients with influenza[1]. In Greece, 49.4% of patients received antibiotics for generally presumed to be viral URTIs[2]. In Massachusetts, USA, doctors prescribed antibiotics for 50.4% of times for viral URTIs[3]. In Urbana, USA, the antibiotic prescription rate was 30% for viral respiratory tract infections[4]. In Australia, antibiotics are used outside the recommended guidelines for acute respiratory infections[5].

Antibiotic resistance is a common problem all over the world. Antibiotic resistance leads to longer hospital stays, higher medical costs and increased mortality[6]. Therefore, health professionals are expected to prescribe and dispense antibiotics only when they are needed, according to accepted guidelines.

Objective of this study was to identify use of antibiotics for patients presenting with symptoms suggestive of URTIs for less than 3 days to the outpatient department (OPD) of Teaching Hospital, Karapitiya, Sri Lanka.

## Methodology

Study was conducted as a cross sectional study. Data were collected from patients who came to obtain medication having symptoms suggestive of URTIs for 3 days or less to OPD of the Teaching Hospital Karapitiya in Sri Lanka. Patients who attended OPD from 8 a.m. to 12.00 noon on week days from 10th September 2017 to10th November 2017 were recruited for the study after obtaining consent. An interviewer administrated questionnaire was used to collect data.

Presence of following symptoms and their duration were recorded from patients. Symptoms were categorized as group 1symptoms (runny nose, sneezing, cough, nasal obstruction, sore throat) and group 2 symptoms (fever, headache, tiredness, myalgia, body aches, malaise, chills). Patients with at least two symptoms from group 1 were included for the study. Those having group 2 symptoms without group 1 symptoms were not included in the study. Those who had similar symptoms and had treatment within 14 days of OPD visit were excluded the study. Prescribed treatment by doctors in OPD was recorded. If antibiotics were prescribed, type, dose and duration of antibiotic prescription was recorded. In addition, age and gender of the patients were recorded.

Data were analyzed using SPSS. The ethical approval for the study was obtained from the Ethical Review Committee of the Faculty of Medicine, University of Ruhuna.

## Results

Total of 612 patients with symptoms suggestive of URTIs for less than three days were included in the study of which, 440 were prescribed antibiotics (71.90%). We did not find any investigation ordered for these patients.

Antibiotics prescribed are shown in table 1.

**Table 1: Antibiotics prescribed by doctors.**

| Antibiotic | Number of patients who were prescribed | Percentage |
|---|---|---|
| Amoxicillin | 355 | 80.68% |
| Cephalexin | 38 | 8.64% |
| Ciprofloxacin | 31 | 7.05% |
| Erythromycin | 14 | 3.18% |
| Co-amoxiclav | 2 | 0.45% |
| Total | 440 | 100% |

**Table 2: Prescription of antibiotics according to the age categories**

| | Below 12 y | Between 12y - 60y | Above 60y |
|---|---|---|---|
| Number of patients who were prescribed | 140 (65.1%) | 265 (76.1%) | 35 (71.4%) |
| Total patients | 215 | 348 | 49 |

**Table 3 Prescription of antibiotics for patients with different symptoms**

| Symptoms | No of patients antibiotic prescribed | No of patients presenting with symptom | Percentage prescribed with antibiotics |
|---|---|---|---|
| Runny nose | 276 | 385 | 71.6% |
| Sore throat | 305 | 395 | 77.2% |
| Sneezing | 325 | 445 | 73.0% |
| Cough | 364 | 497 | 73.2% |
| Nasal obstruction | 214 | 306 | 69.9% |
| Hoarseness | 206 | 266 | 77.4% |
| Fever | 159 | 214 | 74.2% |
| Body ache | 240 | 330 | 72.7% |
| Headache | 275 | 389 | 70.6% |
| Tiredness | 229 | 308 | 74.3% |
| Chillness | 53 | 70 | 75.7% |
| Myalgia | 134 | 168 | 79.7% |
| Malaise | 140 | 191 | 73.2% |

**Age distribution**

Data were analyzed under three age categories: below 12 years, between 12 -60 years and above 60 years. Prescription of antibiotics according to the age categories is given in table 2. There is a significant difference in the percentage of antibiotic prescription in these three age categories ($p<0.005$, Chi Square test).

**Distribution of symptoms**

Thirteen symptoms were investigated. Prescription of antibiotics for patients with these symptoms was analyzed and shown in table 3. Patients with sore throat, hoarseness and myalgia received the highest percentage of antibiotics. These three symptoms are significantly associated with prescription of antibiotics according to Chi-square analysis ($p< 0.0001$, 0.005 and 0.005 respectively).

**Duration of symptom and antibiotic use**

**Table 4 Duration of symptoms and prescription of antibiotics.**

| Duration of symptoms | | No of patients antibiotics prescribed | Total number of patients | Percentage prescribed with Antibiotics |
|---|---|---|---|---|
| Less or more than **24hr** | All symptoms less than 24hrs | 138 | 193 | 71.5% |
| | At least one symptom more than 24 hrs | 302 | 419 | 72.0% |
| Less or more than **48hr** | All symptoms less than 48hrs | 307 | 424 | 72.4% |
| | At least one symptom more than 48 hrs | 133 | 188 | 70.7% |

Duration of symptoms and prescription of antibiotics are shown in table 4. Duration of symptoms was not significantly associated with prescription of antibiotics. When analyzing the duration of three symptoms – sore throat, hoarseness and myalgia separately, they were not significantly associated with prescription of antibiotics.

**Discussion**

The study found that very high percentage of patients received antibiotics for conditions most likely to be viral infections. Equal percentage of patients with symptoms for less than 24hrs and symptoms for more than 48hrs received antibiotics. It is clear that duration of the diseases was not a considerable factor when prescribing antibiotics. If antibiotics were prescribed considering possible secondary bacterial infections, more antibiotic prescriptions would be expected for patients with prolonged symptoms.

Symptoms other than sore throat, hoarseness and myalgia have failed to show significant associations with antibiotic prescriptions. Therefore, it appears that the decision to prescribe antibiotics was taken without considering most symptoms and duration of these symptoms.

Antibiotic use for 58 % patients with influenza was reported in a previous study[1]. Antibiotic use for 49.4%[2], 50.4% [3], and 30% [4] of patients with viral respiratory tract infections were reported in three other previous studies. Compared to all these studies, current study revealed very high use of antibiotics for possible viral infections.

The most commonly used antibiotic was amoxicillin and the least commonly used antibiotic was co-amoxiclav. Amoxicillin was the most commonly used and recommended antibiotic for acute bacterial rhinosinusitis[7,8] which may be one possible reason for high use of amoxicillin for these patients. Even the very low use of antibiotics like co-amoxiclav within the first three days needs serious attention since this is an antibiotic reserved for conditions not responding to other antibiotics in countries with well-regulated antibiotics use[9].

Children below 12 years were prescribed antibiotics at a slightly lower rate than for elderly. It is not clear the reason for lower use of antibiotics for children. However, the study found that the presence of three

symptoms - sore throat, hoarseness and myalgia - led to higher antibiotic prescription which are less common among children below 12 years.
Since OPD of this hospital has many medical officers treating patients, there can be individual variations in prescribing antibiotics which was not investigated in this study. In a previous study on general practitioners, wide range of individual variation from 20%to 80% in prescribing antibiotics for URTIs was reported[10]. There can be variation in different hospitals in antibiotic prescription rate. In addition to that, there can be variation between hospitals.

There is no cost for patients and there is no system to record the use of antibiotics related to patient or prescriber in the OPD of this government run hospital. Therefore, unmonitored 'free' availability of antibiotics can be a reason for high usage of antibiotics.

Perceived advantages of antibiotics, pressure from patients and less regulated antibiotic usage were highlighted as reasons for high use of antibiotics by family physicians[11].
Other reported reasons for prescribing antibiotics include diagnostic uncertainty, socio-cultural and economic pressures, concern over malpractice litigation and meeting parental expectations of an antibiotic for their children[12].

Pichichero[12], in a systematic review, presented research evidence against the use of antibiotics as a preventive measure of secondary bacterial infection after URTIs. Doctors' concern that they may miss a serious diagnosis or a complication also leads to prescription of antibiotics[13]. However it was reported from a cohort study that reducing the rate of antibiotic prescribing for URTIs was not associated with increased rates of mastoiditis, empyema, bacterial meningitis or intracranial abscess but slightly increase treatable pneumonia and peritonsillar abscess[14]. On the other hand, many benefits of low antibiotic use such as reduced antibiotic resistance, avoiding side effects, low cost, reduced 'medicalisation' effect (unwanted belief on antibiotic leading to seek medical attention in subsequent illness unnecessarily) were reported[15].

Probably most patients in our sample do not require treatment from a hospital OPD. Paracetamol, an over the counter drug, and reassurance from doctors is probably adequate for most patients. It was suggested in a previous study that URTI of age 18–59 years patients may be better managed through patient self-care rather than primary care consultation due to many benefits[10].

However, there is some possibility of suspected secondary bacterial infections even within 3 days period and a possibility of complicated patients such as immunocompromised and elderly. In those instances, antibiotic prescription could be justifiable.

Lack of policy and clear guideline on antibiotic use together with poor implementation of existing regulations may have contributed to this misuse of antibiotics. It is a known fact that antibiotic use is irrational in Sri Lanka and other South Asian countries [16,17,18]. Some bacterial resistance is among the highest in this region according to published data[18]. Educating doctors about guidelines and policies may reduce the unnecessary use of antibiotics.

## Conclusion

Nearly 72% of patients with symptoms suggestive of URTIs for less than 3 days presenting to OPD of Teaching Hospital Karapitiya, Sri Lanka were prescribed

antibiotics which is the highest rate compared to all other studies published on antibiotic prescription for URTIs.

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**Conflicts of Interests**
None

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