

# Evaluation of over prescription of antibiotics for upper respiratory tract infections in children $\leq 12$ years old in Kirkuk, Iraq

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**Objective** This study aimed to highlight on inappropriate antibiotic prescribing in upper respiratory tract infections (URTIs) in children in primary healthcare center (PHCC) in Kirkuk, Iraq.

**Methods** This is a cross-sectional retrospective study conducted over 5-month period (November 1, 2018–March 31, 2019) for children  $\leq 12$  year old complaining from URTIs attending Azadi 2 PHCC, Kirkuk, Iraq. Information obtained from registry of the PHCC.

**Results** Our study sample was 300 patients, there were  $n: 152$ , 51% females and  $n: 148$ , 49% males. The most common diagnosis was common cold ( $n: 120$ , 40%) followed by pharyngitis ( $n: 114$ , 38%), tonsillitis ( $n: 40$ , 13.3%), otitis media ( $n: 21$ , 7%), and the less common diagnosis was acute sinusitis ( $n: 5$ , 1.7%). Combined prescription of antibiotics with adjuvants was the most common finding ( $n: 256$ , 85%) while prescription of adjuvants alone was in the second ranking ( $n: 42$ , 14%). Antibiotics was prescribed for 89.5% patients diagnosed with pharyngitis and 79.2% of patients diagnosed with common cold.

**Conclusion** Antibiotics over prescription is high in a primary healthcare facility practice. Health authorities should enforce strict control or out rightly stop antibiotics over prescription to reduce chances of the emergence antibiotics resistance.

**Key Words** Antibiotics over prescription, children  $\leq 12$  year, URTIs, PHCC, Iraq

## Introduction

Upper-respiratory-tract infections (URTIs) occur commonly in childhood, on average, a healthy 3-year-old child suffers from 6 to 10 colds per year.<sup>1</sup> URTIs in children are usually mild, viral, and self-limiting; however, the symptoms can cause fever and make child irritable, lethargic, and uncomfortable. The treatment strategy is to minimize symptoms and discomfort.<sup>2</sup> In family practice; even physicians who are aware about over prescription of antibiotics in URTIs, often prescribe it.<sup>3</sup> Because of its high prevalence in general practice, URTIs are considered as an important target for educational strategies aimed at reducing inappropriate prescriptions of antibiotics,<sup>4</sup> and also because antibiotics are commonly prescribed even for those illnesses that have a predominantly viral etiology, such as common cold for example.<sup>5</sup>

At the present time, antibiotic resistance is a major public health problem.<sup>6</sup> A major risk factor is irrational antibiotic use, e.g., in patients with common respiratory tract infections even that there is no evidence found for the benefit of antibiotics.<sup>7</sup>

The emergence of bacterial species that are increasingly resistant to antimicrobial agents is a growing concern today. These resistant strains are, in part, due to frequent and inappropriate antibiotic therapy for children with upper respiratory tract illnesses. Approximately, three-fourths of all outpatient antibiotic prescriptions given to children are for upper respiratory tract conditions, such as viral pharyngitis, sinusitis, and otitis media. To address this growing problem, the Centers for Disease Control and Prevention and the American Academy of Pediatrics published “The Principles of Judicious Use of Antimicrobial Agents for Pediatric Upper Respiratory Tract Infections.”<sup>8</sup>

Over the past decade, antibiotic resistance has been recognized as an important public health problem because discovery of new antibiotics is no longer in harmony with the spread of highly resistant bacterial pathogens.<sup>9</sup> Prescription of antibiotics for URTIs is a very common practice in pediatrics, although there is sufficient evidence to support the viral origin of most of those illnesses, however, even some of the bacterial illnesses (such as otitis media and sinusitis) are usually self-limited, and antibiotic treatment is unnecessary.<sup>10</sup>

## The aim of this study

This study was undertaken to evaluate if there is an over prescription or inappropriate use of antibiotics by physicians for children with URTIs in a primary healthcare facility.

## Patients and methods

This study was conducted through retrospective cross-sectional review of prescriptions for children patients aged 0–12 years who attended family medicine/general practice physicians in Azadi 2 primary healthcare center (PHCC), Kirkuk2 primary healthcare district, Kirkuk health directorate, Iraq for symptoms of URTI over the period from November 2018 to March 2019. Information obtained from Azadi 2 PHCC registrations. Three hundred patients were included in this study, the sample comprised of those patients diagnosed with URTIs who met inclusion criteria for patients with only a single diagnosis from the following list: common cold, pharyngitis, tonsillitis, otitis media, and acute sinusitis. All diagnoses were considered acute unless specified as chronic or recurrent, in such case it was excluded from the study sample.

The study was approved by the Medical Ethical Committee of Kirkuk Health Directorate; the reference number of the approval is 13743 in 15/04/2019.

## Results

Among our study sample (300 patient), there were  $n$ : 152, 51% females and  $n$ : 148, 49% males, more than half of the patients ( $n$ : 157, 52.3 %) were in 1–6 year age group as shown in Table 1

The most common diagnosis was common cold ( $n$ : 120, 40%) followed by pharyngitis ( $n$ : 114, 38%), tonsillitis ( $n$ : 40, 13.3%), otitis media ( $n$ : 21, 7%) and the less common diagnosis was acute sinusitis ( $n$ : 5, 1.7%) as shown in Fig. 1.

Combined prescription of antibiotics with adjuvants was the most common finding ( $n$ : 256, 85%), while prescription of adjuvants alone was in the second ranking ( $n$ : 42, 14%) as shown in Fig. 2.

Antibiotics used were: amoxicillin, cephalixin, trimethoprim/sulfamethaxazole.

Adjuvants used were: paracetamole, salbutamole, ibuprofen, theophylline, chloramphenarmine, bromhexine, coldin (paracetamole, chloramphenarmine & phenylephrine), tussilet (chloramphenarmine, glyceryl guaciale & phenylephrine)

Antibiotics prescribed for  $n$ : 102, 89.5% from patients diagnosed with pharyngitis and for  $n$ : 95, 79.2% from patients diagnosed with common cold as shown in Fig. 3.

## Discussion

The purpose of this study was to explore antibiotics over prescribing for children patients with URTIs attending primary healthcare facility in order to gain information about the use of these medications, so we make recommendations and health authorities can develop strategies that will promote judicious use of these important drugs.

Table 1. Sex and age distribution of study sample

Variable	Number	Percent %
<b>Sex</b>		
Female	152	51
Male	148	49
<b>Age</b>		
< 1 Year	41	13.7
1-6 Year	157	52.3
7-12 Year	102	34

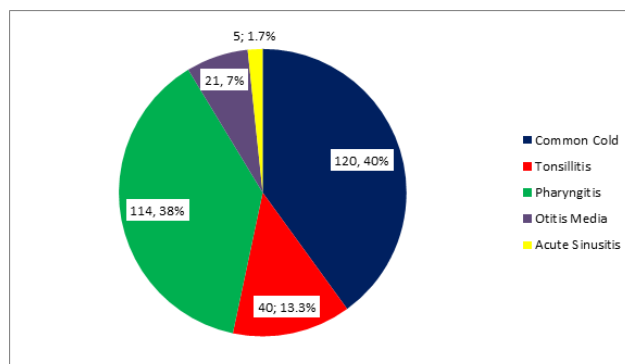


Fig. 1 Distribution according to the type of URTIs diagnoses.

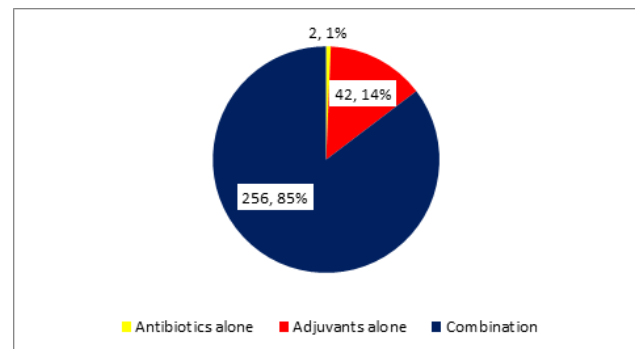


Fig. 2 Distribution of medications prescribed in URTIs.

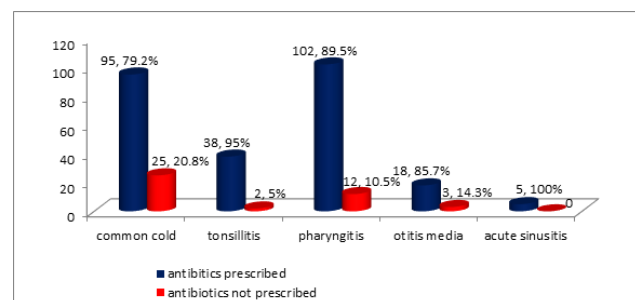


Fig. 3 Distribution of antibiotic prescribing according to types of URTIs.

URTI is a common presentation in PHCCs (up to 10% of presentations).<sup>11</sup> The wide use of antibiotics in pharyngitis, common cold, and non-specific URTI will not improve patient condition, but even some patients reported adverse effects compared with placebo.<sup>12</sup> So, antibiotics are not indicated in most of patients with URTIs. Overuse of antibiotics contributes to the emergence of antibiotic resistance.<sup>13</sup> Despite the risk to individual and population health, inappropriate antibiotic use is still widespread in URTIs.<sup>14</sup>

In our study, common cold and pharyngitis was the most common diagnosis among children attended the PHCC for URTIs symptoms; 40% and 38% respectively and this is in convenient with a study done by Kunda *et al* in 2015 who found that 34% from study sample were diagnosed as common cold [15].

Antibiotic over prescription is a real health problem in many countries and the results in our study shows that Iraq is not an exception, we found that most of children diagnosed as common cold received antibiotics (79.2%) and this rate is a good reason to worry because prescribing antibiotics for common cold in adults and children does not have any therapeutic advantages, it is only to augment the threat of developing side effects, especially in children. These results are in agreement with a study conducted in Eritrea, which confirmed that 75% of the adults and children diagnosed with URTIs were prescribed antibiotics<sup>16</sup> and in Malaysia in 2013, the rate of antibiotic prescribing for URTIs was 64.8%.<sup>17</sup>

In this study, we found that antibiotics prescribed with adjuvant medications for children complaining from URTIs in 85% from study sample, which is in agreement with results of a study done by Shlomo *et al* in 2003 who stated that: URTIs are viral in 80% of the cases and do not respond to antibiotic

therapy but physicians in many settings frequently prescribe antibiotics for these illnesses, hence URTIs are important goals for strategies plan for decreasing excessive antibiotic prescription.<sup>18</sup>

In summary, this study provides a baseline of the knowledge, attitude, and behavior regarding prescription of antibiotics among family medicine/general practice physicians in PHCCs. Their attitude and behavior regarding antibiotic prescription for children patients with URTIs characterized by unnecessary and irrational use even in a very highly suspected infections of viral origin like common cold and pharyngitis.

## Recommendations

The study exposed very important results on the basis of which recommendations can be made so as to decrease the unreasonable use of antibiotics:

- Physicians continuing medical education should be strengthened through workshops about rational use of antibiotics and risks of emergence of drugs resistance.
- To facilitate the confirmed diagnosis of bacterial URTIs, it is recommended that a rapid streptococcal antigen test kit

to be available in all primary healthcare facilities to prescribe the appropriate antibiotic.

- Health authorities should consider procure cough syrups (antitussives and expectorants), these will help to decrease antibiotics prescribing by giving a placebo effect to patients. Cough syrups can be the first line choice in patients with URTIs because these cough syrups also contain antihistamines, analgesics, etc. which helps to improve symptoms even supposing that the cost of these cough syrups could be a problem, the cost of antibiotic resistance is more higher.
- Increase alertness about antibiotics overuse and resistance among the community. Plans must be used to cover a wide range of activities like social media, folders, radio, and television.

## Conflict of Interests

None declared.

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