Community-Based Study on the Misuse of Antibiotics in Paediatrics Otolaryngic Infections in Kirkuk

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ABSTRACT

Antibiotics are the treatment of choice for many bacterial infections, but the increasing misuse of antibiotics has led to a growing emergence of antimicrobial resistance. This study aimed to appreciate current trends in misuse or inappropriate prescribing of antibiotics in the management of pediatric otolaryngic infections. This community-based descriptive study was conducted in the center of Kirkuk Governorate (Iraq) between November 2021 and March 2022. The use of 300 prescriptions for otolaryngic infections in children was evaluated, by recording data related to infections as well as the appropriateness of the antibiotics, to determine if the antibiotic prescriptions used are appropriate or not. The results showed that out of 300 prescriptions, 210 (70%) had viral infections vs. 90 (30%) non-viral, including bacterial infections, and (90%) of these viral infections had antibiotics misuses. The responsibility for this misuse of antibiotics was recorded among parents with the highest rate (40%) then general practitioner physicians (25%). Also, it was noted that (80%) of the inappropriate prescriptions were orally treated. The study concluded that the proportions of antibiotics misuses of otolaryngic infections were high, so it recommended adherence to instructions for prescribing antibiotics, and activating educational and awareness programs that reduce inappropriate prescriptions, especially for general practitioner physicians. Also, the emphasis on following up pharmacies periodically to prevent the dispensing of antibiotics without medical prescriptions

Keywords: Otolaryngic infections, antibiotic prescriptions, viral infections

Introduction

The misuse of antibiotics is a major public health problem worldwide [1]. It is known that antibiotic drugs are designed to destroy bacteria or inhibit their growth, but these drugs are often used inappropriately to treat viral infections without having any effect on these viruses. In other words, the effectiveness of antibiotics is limited to treating many bacterial infections, if used properly [2,3]. Among the problems related with misapply of antibiotics are development of antibacterial resistance, along with the increased costs of health services, and the development of side effects resulting from these drugs [4]. Many previous observational studies have shown that misuse of antibiotics is more common in children, especially with viral otolaryngic infections [5-7]. There are many contributing factors related to the misuse of antibiotics at the level of parents of children as well as the level of physician, including the level of education and socio-economic status. In addition, some physicians link their pattern of over-prescribing to the urgency of patients or parents for pediatric patients [8,9].Tonsils are located in an

area where microorganisms are abundant, as these microorganisms can penetrate the tissues of the tonsils when any defect occurs in the epithelium and settle the lymphatic system responsible for all person attacks of tonsillitis [10,11]. Therefore, it is important to identify the pathogens (organism) that cause tonsillitis, especially in children, as they are most vulnerable to this infection [12]. Most sinus infections in children are consequences of viral upper respiratory infections, most commonly rhino, influenza, and recently corona viruses [13,14]. Sinusitis causes stagnation of secretions and poor ventilation of infected sinuses and viruses can directly inhibit cilia function [15]. It is worth noting that a large bacterial growth may occur with a viral infection. Sinusitis may be caused by allergies and triggered by allergens [16]; therefore correct diagnosis of the causative agents will permit remediation and preventing of the infection with more acceptable medical treatments, including antibiotics [17].Otitis media can be simply defined as inflamed in the mucosal membrane of middle ear fissure including tympanic cavity, mastoid antrum, mastoid air cells and the Eustachian tube [18]. Viruses are the most common causative agents of otitis media such as respiratory syncytial virus as well as rhinovirus. Besides, some bacteria species can also cause otitis media [19]. It represented as the generality childhood infectious illness [20]. It is worth noting that determining the etiology of all above infections is an important step in their appropriate treatments and managements [21]. This study highlights current trends in the misuse or inappropriate prescribing of antibiotics in the management of pediatric otolaryngic infections in Kirkuk (Iraq) as an attempt to avoid or even reduce the negative effects of unrequired antibiotic use.

Methodology

Patients and Study Design

This descriptive community study was conducted in different departments of private hospitals, as well as specialized private clinics in the center of Kirkuk Governorate, northern Iraq. It continued from the beginning of November 2021 until the end of March 2022. The evaluation of the use of 300 prescriptions for pediatric otolaryngic infections was completed, by recording the characteristics of each patient such as name, age, gender, and data related to the appropriateness of the dose of antibiotics for each infection case, in addition to observing laboratory tests and medical reports for each patient who received antibiotic treatment in forms designated for the study. Data were collected to determine whether the antibiotic prescriptions used were appropriate or not, as well as the type of inappropriate antibiotics, and the method of administration.

Inclusion Criteria

Paediatrics patients with one of the three otolaryngic infections; tonsillitis, sinusitis, or otitis media (Fig 1) , of both genders whose parents formally agreed to participate in the study, and whose ages ranged between (2-15) years old, were included in this study.

Exclusion Criteria

Paediatrics without one of the otolaryngic infections (tonsillitis, sinusitis, or otitis media), ages older than 15 years, and parents who refused to participate, as well as patients with incomplete data, were excluded.

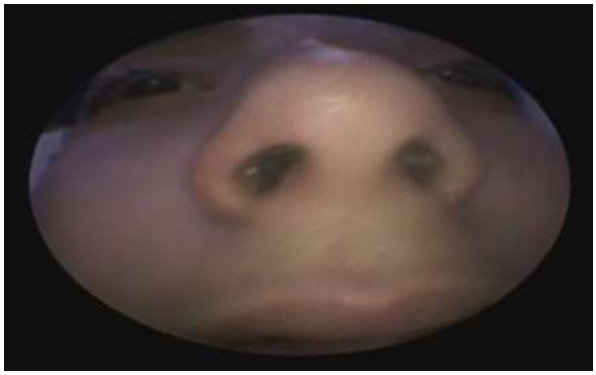
The most common misuse antibiotic was determined for all paediatrics participating in the study. As for antibiotics, the classification was approved according to the unified classification system by Quintiles IMS, which included agents in the following categories: Beta-lactams with increased activity (Amoxicillin-clavulanate), Cephalosporin (second and third generation), macrolides (Azithromycin).In terms of the source responsible for the misuse of antibiotics for these participating patients, the analysis was done in four main groups to assess the rates based on the misprescribing of antibiotics by specialty as follows: general practitioners physicians in primary health centers, pediatricians, otolaryngologists, parents.

Statistical Analysis

To analyze the data descriptively, SPSS version 26 was used using an appropriate non-parametric test, and the results were represented by frequencies and percentages. Microsoft Excel 2010 was used to display the results in clear forms, whether a bar or pie chart.

A: Viral pharyngitis (not require antibiotics).

B : Acute folicular tonsillitis (require antibiotics).



C : Viral sinusitis (not require antibiotics) .

D: Sinisitis with complication (require antibiotics).

E : Otitis media with effusion (not require antibiotics).

F: Suppurative ottitis media (require antibiotics).

Figure 1 : Cases of pediatric patients with infections of otolaryngic (A-F) .

Results

From a total of 300 prescriptions analyzed in this study, it was found that 210 (70%) of them were suffering from viral infections, compared to 90 (30%) non-viral infections, including bacterial infections (Fig. 2).

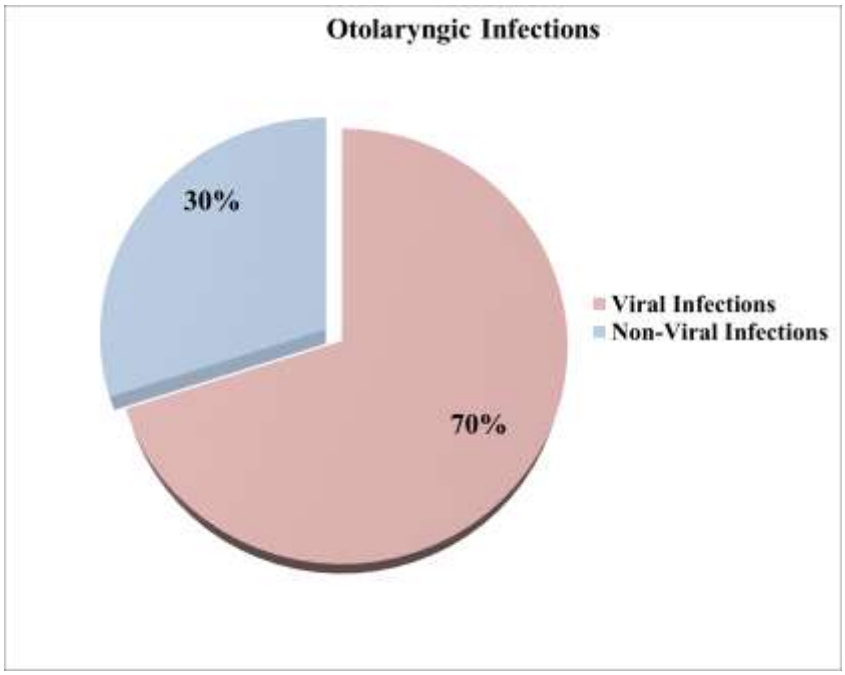


Figure 2: Distribution of prescriptions for otolaryngic infections.

Among the 210 cases of these viral infection, it was observed that 190 (90%) of them were misused antibiotics versus 20 (10%) cases without misused antibiotics (Fig. 3).

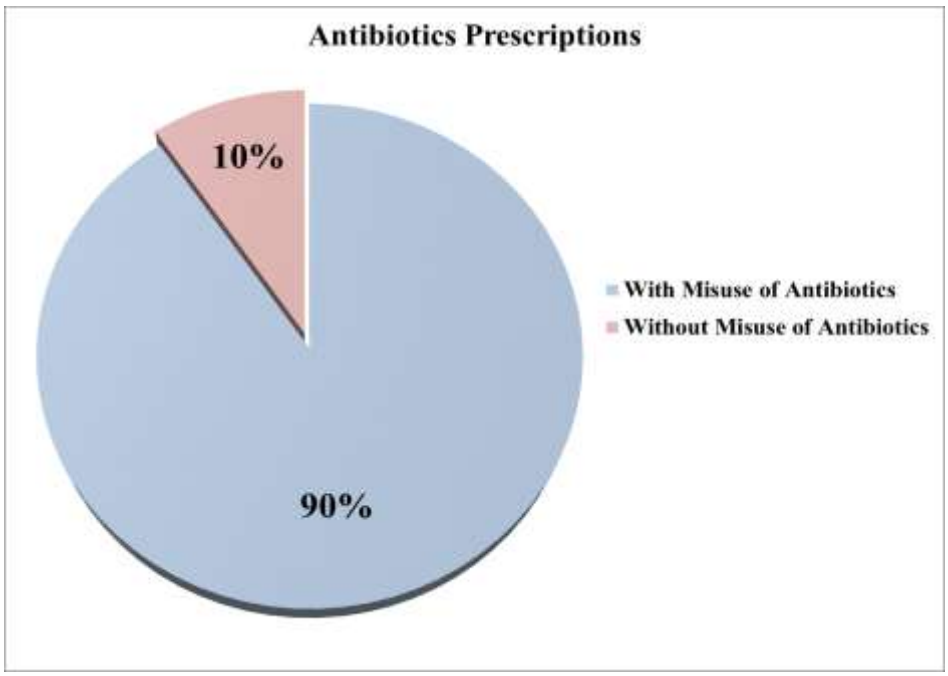


Figure 3: Distribution of misuse antibiotics for viral otolaryngic infections.

The results also showed that the responsibility for the misuse of antibiotics was recorded at a higher proportion for parents 76 (40%), followed by general practitioner physicians 47

(25%) and pediatricians 39 (20%), and with the lowest proportion for otolaryngologists 28 (15%) as shown in Figure (4).

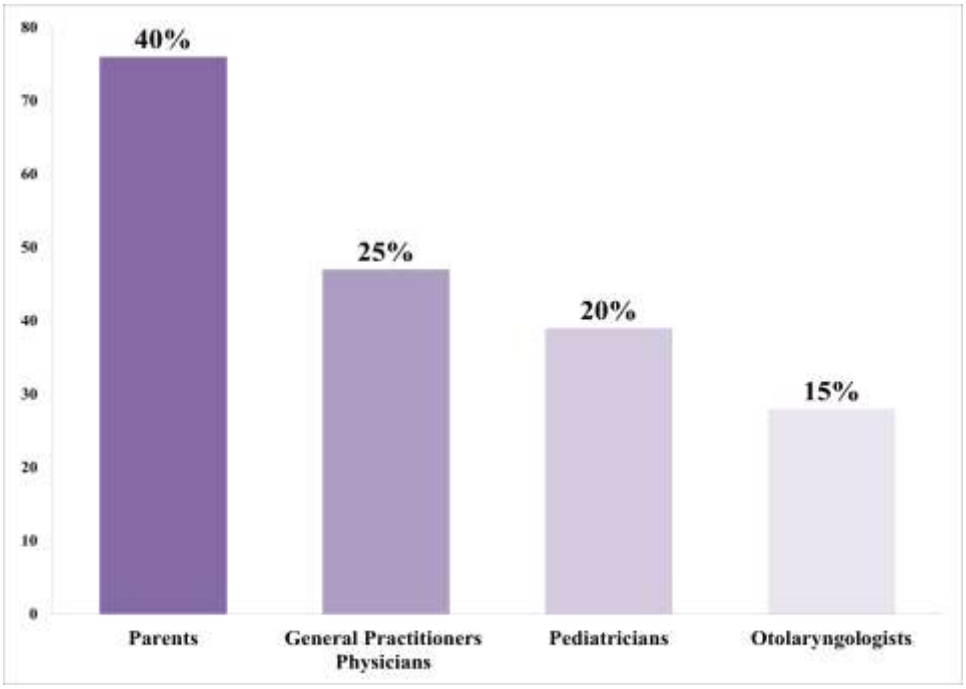


Figure 4: Proportions of responsibility for the misuse of antibiotics.

In addition, it was noted that 38 (20%) inappropriate prescriptions were for injectable antibiotics, while 152 (80%) were inappropriate prescriptions for oral antibiotics, as follows: 66 (35%) of them were for amoxicillin, 48 (25%) were for cephalosporin and 38 (20%) were for azithromycin (Fig. 5).

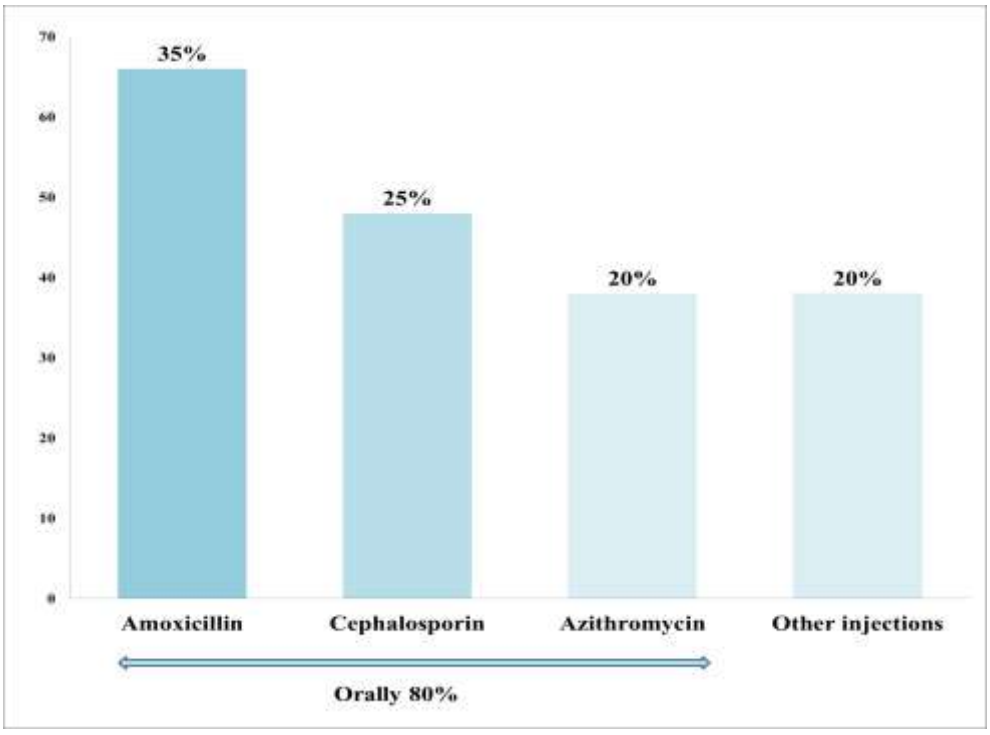


Figure 5: Proportions of inappropriate antibiotic prescriptions.

Discussion

According to the founding of this study, which was conducted on pediatric patients attending specialized clinics, hospitals, or health centers within the health sector of Kirkuk governorate, it was proven that 90% of these patients were prescribed antibiotics for the treatment of otolaryngic infections without appropriate indications. This high rate of misuse of antibiotics explains the development of multiple resistances to common antibiotics, thus increasing the exposure of infected children to serious complications [22,23]. It should be noted that there are increasing concerns about inappropriate antibiotic prescriptions, as there is no clear indication of a decrease in the rates of misuse antibiotics worldwide [24]. Obviously, there are significant differences in these inappropriate antibiotic uses across countries, with increasing rates of antibiotic misuses being related with rising proportion of antimicrobial resistance [25]. Also, this study was found that general practitioner physicians were more reasonable of composes antibiotics for unsuitable reasons than specialist doctors, and this may indicate their lack of experience in correctly diagnosing infections [26]. Since it is difficult to tell whether a person has tonsillitis due to a virus or bacterial infection just by looking at their throat, more accurate confirmatory tests are required [27]. Antibiotics should be recommended if examinations results demonstrate that tonsillitis is caused by a bacterial infection [28] .There is no doubt that infants and young children are most susceptible to otitis media, especially between the ages of 6 months and 3 years old. It is predominately diffuse among children with cleft palate defects, and those of weak socioeconomic conditions [29,30]. It is inconceivable for clinicians to miss accurate diagnosis of non-bacterial etiologies in young children, as lack of diagnosis leads to mismanagement and increased emergence of antibiotic resistance and non-response, thus increasing the risk of complications [31,32].

Conclusions

There was a high rate of misuse of antibiotics for otolaryngic infections in the health district of Kirkuk governorate, so more studies are needed in the rest of the governorates. In addition, this study came out with several recommendations, including adhere to the instructions for antibiotics using in outpatient clinics, and activate effective interventions that contribute to reducing inappropriate antibiotic prescriptions. Effective interventions include setting up educational and awareness programs that reduce inappropriate prescriptions, especially for practitioner physicians. Also, make sure that pharmacies follow up regularly and avoid dispensing antibiotics without a prescription.

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