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Evaluation of Rational Antibiotic Dispensing in the Community Pharmacy Setting: A Simulated Patient Study

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ABSTRACT

In the present study, it is aimed to evaluate rational antibiotic dispensing without prescription in the community pharmacy setting by using a simulated patient method. This study was conducted over a total of 70 pharmacies in Malatya, located in the east part of Turkey. The person, who acts the husband of a patient with acute uncomplicated rhinosinusitis, visited the pharmacies to conduct the simulated patient scenario. Of the total community pharmacies that were visited 55.7% of them were run by female pharmacists. Thirty-two (45.7%) pharmacists recommended various medication regimens, including antibiotics. Of them, 67.1% referred the simulated patient to a physician. In conclusion, it was observed that dispensing antibiotics without prescription was still high, pharmacists did not take comprehensive medical or medication history from patients, and pharmacists provided insufficient medication information to the patient regarding suggested medications at community pharmacy setting.

Keywords: Antibiotic, Community Pharmacy Services; A Simulated Patient; Pharmacist

INTRODUCTION

The irrational utilization of antibiotics is still a serious global problem which, if one takes into consideration the magnitude of antibiotic resistance, threatens both public health and the economy. In Turkey, the high rate of irrational antibiotic dispensing is a well-recognized fact that has existed for many years in the community pharmacy setting. In Turkey today, it is illegal to dispense antibiotics without prescription. Since 2014, the control of antibiotic dispensing has increased in the community pharmacy setting. However, it is more common to use simulated patient techniques to control antibiotic dispensing in countries in which the rate of antibiotics being dispensed without prescription is high.[1-3]

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The reason for selecting this method is not to audit or supervise the pharmacist. It has been well documented that the most efficient and reliable feedback which can contribute to the development of professional skills can be obtained by using the simulated patient method.[1] It is easier to observe when pharmacists inappropriately dispense antibiotics without prescription by using the simulated patient method.[4]

It has been well documented that in cases where there is no great risk of bacterial infection, treatments with antibiotics do not provide additional benefits. Treatment with antibiotics is not recommended in cases where the duration of symptoms is less than two days and where there is no high fever.[5] However, in many simulated patient studies, it has been observed that antibiotics which were suggested without prescription were common in cases with acute uncomplicated rhinosinusitis or other acute infections.[5-8]

According to the report by the Turkish Ministry of Health based on records of Prescription Information System in 2011 and 2012, it was determined that the rate of prescribing antibiotics by general practitioners were approximately 35.0% and 34.0%, respectively.[9] The elevated utilization of antibiotics is not unique to Turkey and other developing countries; it is also common in Europe. For example, between 1980 and 1990, the rate of increase in antibiotic utilization for upper respiratory infections was 46.0% in the UK, while in France 86.0% in adults and 15.0% for children. It should be emphasised that this increase in the utilization of antibiotics was more prominent for new antibiotics on the market.[8]

It is well known that the rate of antibiotic utilization and prescription is particularly high in cities located in the east and southeast of Turkey.[9] With this information it is hoped that by using a simulated patient method the possible rate of antibiotic dispensing without prescription can be evaluated. The second aim of this present study is to assess the practices of community pharmacists during the recording of patient histories and patient education.

METHODOLOGY

Study Design

This study was conducted in Malatya, a city located in the eastern part of Turkey. The ethical approval for the present study was given by Marmara University, Ethical Committee of Health Science (Protocol Number: 24.12.2014-6). Permission was granted by Malatya Chamber of Pharmacy. After receiving the necessary permission, all the pharmacies located in Malatya were informed about the present study, the aim of which was to evaluate rational drug utilization. After this stage, those pharmacies which did not want to participate in the study were excluded.

Sample Size Calculation

As of December 2014, a total of 214 pharmacies was registered with the Malatya Chamber of Pharmacy. The sample size was sixty-seven pharmacies, with a confidence interval of 95% and error of margin of 10%. The study was conducted over a total of 70 pharmacies. All the pharmacies were listed alphabetically and were randomly selected and allocated random numbers by a computer-based program.

Data Collection

All appointments were carried out with the pharmacists. When the simulated patient entered the pharmacy, he would first ask to talk to the pharmacist. The patient could confirm whether they were talking to the pharmacist by checking the photograph of the pharmacist on the wall; it is law in Turkey that a photograph of the pharmacist be hung on the wall. Although, the information regarding simulated patient was not given consecutively, the simulated patient provided other information if the pharmacist asked for it.

The simulated patient visited the community pharmacies as a husband of patient with acute uncomplicated rhinosinusitis. The simulated patient was trained regarding the standard information to be provided by the researchers and informed about the privacy of all information that would be gathered during the present study.

The scenario for the simulated patient was created according to previously performed studies.[5-8] A simulated patient demanded medication for pain located in the region of the frontal sinuses. The other information regarding the simulated patient was listed as following; he was purchasing this medication for his wife, who was 24 years old; she had a fever of 38-38.5^{o}C, she also had running nose; she had a history of rhinosinusitis and she had used antibiotics in the past, but she could not remember the name of the antibiotic; she was currently only using oral contraception and had no history of allergies. If the pharmacists could not give any information regarding suggested medication, the simulated patient would ask information regarding side-effects of the suggested medication. If the pharmacist referred a simulated patient directly to a doctor, a simulated patient would inform the pharmacist that they had an appointment for tomorrow, but they wanted the pharmacist to advise on what to do until that appointment.

After each community pharmacy was visited, the simulated patient filled the check list which had been drawn up for the purpose of the present study. Due to ethical concerns, no audio or video records were used during the study. Any suggested medications were not purchased from the community pharmacy. When

any medication was suggested by the community pharmacists, the simulated patient would reply that he did not have enough money to buy the medication or he already had them at home.

Statistical Analysis

All variables were presented as mean ± standard deviation. Ordinal and nominal data were introduced as number [n] and percentage [%].

RESULTS

The demographic data

Of the total community pharmacies that were visited 55.7% of them had female pharmacists and 44.3% were run by male pharmacists. It was observed that all pharmacists gave less than 3 minutes of attention to the simulated patient. The mean number of questions asked by the pharmacists to the simulated patient was 3.17±1.65. The distribution of the total number of questions asked by community pharmacists is presented in Figure 1.

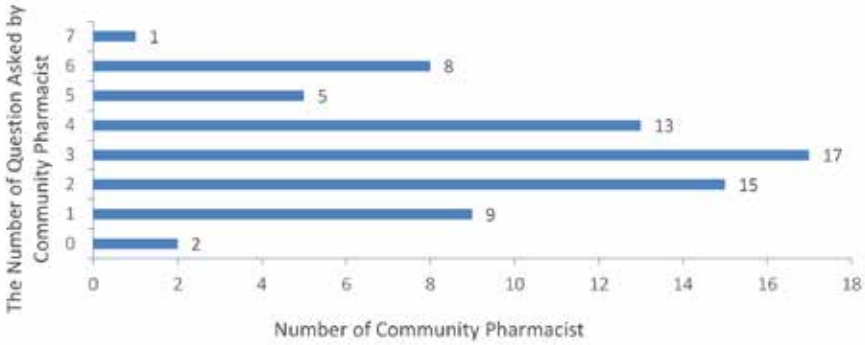

Figure 1: The distribution of the total number of questions asked by the community pharmacist

The attitude of community pharmacists while patient history taken

Of these, 77.1% asked about the age of the patients. Only 25.7% asked for information regarding the duration of the patient's symptoms. Most pharmacists [82.9%] did not ask whether the patient had any chronic disease, while only 15.7% took a history of the patient's medications for chronic illnesses. The symptoms and complaints of simulated patients were investigated by only 18.6% of the pharmacists. Of these, 70.0% asked whether fever was present. How the rhinosinusitis was managed before coming to the community pharmacy was questioned by only 21.4% of the pharmacists. The practice of community pharmacists during the taking of patient history is shown in Table 1.

Table 1: The attitude of community pharmacists while patient history taken

	%
Allergy	0%
Age	77.1%
Symptoms	81.4%
Period of symptoms that patient had	25.7%
Comorbidities	82.9%
Fever	70.0%
Utilization of medication for chronic illnesses	15.7%
Management of rhinosinusitis before coming to the community pharmacy	21.4%

The patient education practices of the community pharmacists

When the medication information that was provided by pharmacists is evaluated, 75.7% of them provided information regarding the reason for using the medication, while 60.0% of them explained how to use the medication. However, only 31.4% clarified when the medication was to be used and only 8.6% of them provided information about how long the medication should be used. None of the community pharmacists provided any information about other medications that could be used if an unusual condition occurred or if the patient forgot to take the medication. The patient education practices of the community pharmacists are presented in Table 2.

Table 2: The patient education practices of the community pharmacists

	%
Indication	75.7
How to use the medication	60.0
When to use the medication	31.4
Duration of medication	8.6
What to do when unusual condition happens	0.0
What to do if he/she forget to take his/her medication	0.0

The suggested medication regimens

Only eleven pharmacists did not suggest any medication to the simulated patient. However, thirty-two (45.7%) pharmacists recommended various medication regimens, including antibiotics. The suggested medication regimens and suggested medications are shown in Table 3 and Table 4, respectively.

Table 3: The suggested medication regimens

	n
No medication	11
Antibiotic + NSAIDs	15
Antibiotic alone	17
NSAIDs alone	25
Combined medications product for cold	2

Table 4: The suggested medications

	n
No Medications	11
Cefuroxime + Dexketoprofen	3
Cefuroxime + Naproxen	2
Cefuroxime	5
Cefuroxime + Diclofenac	1
Naproxen	4
Dexketoprofen	17
Amoxicillin + Clavulanic Acid	12
Amoxicillin + Clavulanic Acid + Dexketoprofen	6
Diclofenac	4
Acetaminophen + Pseudoephedrine + Chlorpheniramine + Oxolamine	1
Amoxicillin + Clavulanic Acid + Naproxen	3
Acetaminophen + Pseudoephedrine + Chlorpheniramine	1

The attitude of community pharmacists

Of these, 67.1% referred the simulated patient to the physician. Among these community pharmacists, 85.1% of them directly referred the simulated patient to the physician and 14.9% of them referred the simulated patient to the physician if no improvement in symptoms should occur.

DISCUSSION

The common usage of antibiotics in the population cannot only be attributed to the prescription rate of physicians. It is well known that despite legal restrictions in many countries, dispensing antibiotics without prescription at community pharmacies and the attitude of the patient have also contributed to an increase in usage of antibiotics.

In the present study, 45.7% of pharmacists recommended various medication regimens, including antibiotics, to simulated patient with symptoms of non-bacterial rhinosinusitis. Of these, 67.1% referred the simulated patient to a physician. Although not purposely timed, the control for dispensing antibiotics without prescription at the community pharmacy had been strictly increased at the time when the present study was conducted. The most striking result of the present study was that after this new implementation, the rate of dispensing antibiotics without prescription was still high.

There are lots of similar studies with similar finding conducted in many different countries. In a systematic review of many studies conducted in various countries between 1970 and 2009[4] it has been determined that the utilization rate of antibiotics without prescription was between 19.0% and 100.0%, except in North America and northern Europe. In the most of the studies that were involved in this systematic review, the utilization of antibiotics without prescription was more common for non-bacterial infections. In this systematic review it was determined that according to the data of studies which used the simulated patient method, antibiotics without prescription were more commonly dispensed in community pharmacies.

In agreement with this present study, in a study conducted in Greece in 2001 it was demonstrated that antibiotics were dispensed without prescription, although in contravention of implementations in the country. In this study, similar to the present study, simulated patients with rhinosinusitis were used. It was observed that 65.0% of the pharmacists suggested broad-spectrum antibiotics to the simulated patients with high fever [40°C] and also 71.0% of them advised broad-spectrum antibiotics to simulated patients with low fever [38.5°C]. In this study, the percentages of simulated patients referred to physicians by pharmacists was 57.0% for simulated patients with high fever [40°C] and 71.0% for simulated patients with low fever [38.5°C].[8] When considering the study conducted in Greece[8] and the present study it can be seen that similar results were attained, despite a period of almost fifteen years between the two studies.

In another study conducted with the simulated patient method for patients with non-complicated rhinosinusitis in Brazil, it was concluded that the percentage of dispensing antibiotics at community pharmacies was 58.0%.[5] Contrary to expectations, it was also determined that dispensing antibiotics to simulated patients with non-complicated rhinosinusitis by pharmacists was greater when compared with pharmacy technicians.[5]

In a simulated patient study with complaints about various acute infections conducted in Saudi Arabia, the percentage of antibiotics being dispensed without prescription was 77.6% for 367 pharmacies.[7] In another study conducted in the

United Arab Emirates, the percentage of antibiotics dispensed without prescription was 68.4% in the community pharmacy setting.[10] In this study, the antibiotics suggested by community pharmacies was a combination of penicillin including β-lactamase inhibitors, penicillin with extended spectrum and second-generation cephalosporin.[10] In the present study the most commonly suggested antibiotics without prescription were amoxicillin and clavulanic acid and cefuroxime axetil.

In the studies mentioned above and the present study, studies conducted in five different countries, high and similar rates of dispensing antibiotics without prescription were determined. It is well known that the utilization of antibiotics without prescription is common, particularly in developing countries. In a study conducted in the Lao People's Democratic Republic, a developing country, 91.0% of patients said that they had received antibiotics without prescription from a community pharmacy during the previous year and 79.0 of patients stated that they did not used their antibiotics during the recommended period.[11]

In a study conducted in Indonesia in which three different simulated patient scenarios were used in the community pharmacy setting, it was determined that 91.0% of pharmacies dispensed antibiotics without prescription; most also provided no health information unless specifically asked by the simulated patient.[6]

In the studies conducted in these countries, which have low social economic status, it is obvious that the rate of dispensing antibiotics without prescription is higher than the present study or the rate shown in studies conducted in developing countries. One exception is a study conducted in Zimbabwe[12]. Interestingly, in this study, the general rate dispensing of antibiotics without prescription was low.

According to the results of a study which aimed to determine the rate of dispensing antibiotics without prescription in Europe in 2006, it was concluded that the rate in eastern and southern Europe was high when compared to countries in northern and western Europe.[13] Although illegal, the rate of dispensing antibiotics without prescription, determined with a simulated patient method, was 45.0% in Spain.[14] This rate was not as high as that found in other studies or in the present study; moreover, the pharmacists in this study gave better and more elucidatory information to the simulated patient. In another study conducted in Spain[15], 28.0% of the participants declared that they had used antibiotics in the previous 6 months for the common cold or sore throat. Moreover, among participants who had used antibiotics in the previous 6 months, 41.0% mentioned that they used these antibiotics without prescription.[15]

Another situation that should be investigated is the existing discrepancy between real-life applications of pharmacist or pharmacy technicians and the information provided.

Although it is known that a lack of knowledge leads to application errors, it is thought-provoking that the attitude of pharmacists was not in concord with recent pharmacotherapy guidelines, even in cases where standard information is available, such as with upper respiratory tract infections or diarrhoea. In a study conducted in Vietnam a questionnaire and simulated patient method was used; 20.0% of pharmacists declared in the questionnaire that they had dispensed antibiotics. However, it was seen that 83.0% had sold antibiotics to simulated patients in the study. Although 81.0% emphasized the lesser effect of antibiotics when used over a short period in the questionnaire in this study, 48.0% advised simulated patients to use antibiotics for less than five days. The results of this study are a good example of the reliability of simulated patient method when compared to questionnaire studies for obtaining the rate of dispensing antibiotics without prescription, and determining the knowledge and attitude of pharmacists towards acute infections. [16]

When evaluating previous studies and this study it can be seen that the rate of dispensing antibiotics without prescription is still very high. More attention should be given to the high rate of dispensing antibiotics without a prescription when the results of these studies are evaluated. The possibility of preventing the sales of antibiotics without prescription should be investigated. It is important to list previous suggestions and actions for preventing the dispensing of antibiotics without a prescription by giving examples from various countries.

In conclusion, it has been observed that the dispensing of antibiotics without prescription is still high, that pharmacists did not take comprehensive medical or medication histories from the patients, and that pharmacists provided insufficient medication information to the patient regarding suggested medications in the community pharmacy setting. To avoid irrational dispensing of antibiotics, it is essential that both health care providers and the general population be educated. Although dispensing antibiotics without prescription is illegal in some countries in the world, new regulations must be introduced to avoid dispensing antibiotics without prescription.

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