

## The sale of antibiotics without prescription in pharmacies in Damascus, Syria

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### Abstract

**Introduction:** Overuse of antibiotics has contributed to the development of organism resistance. The acquisition of antibiotics without prescription by the general population seems to be common practice in pharmacies of Damascus, Syria. This study aimed to determine the proportion of pharmacies dispensing antibiotics without medical prescription and without seeing the patient.

**Methodology:** A cross-sectional study involving a sample of 224 pharmacies was conducted in Damascus. To obtain antibiotics without medical prescription, the investigators posed as individuals who had a sister with symptoms of sinusitis.

**Results:** From 200 pharmacies visited, 87% agreed without insistence from the investigator to sell antibiotics without prescription. This figure increased to 97% when the investigators who were at first denied antibiotics insisted on having the antibiotics.

**Conclusion:** Dispensing of antibiotics is high in Damascus despite federal regulations. Health education programs should be directed to pharmacies and also to the population.

**Key words:** Syria; antibiotics; pharmacies; drug resistance

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### Introduction

Antibiotic resistance is a worldwide problem that is increasing at varying rates in different regions [1]. Countries with the most reserved antibiotic-prescribing patterns have relatively lower rates of antibiotics resistance [2]. Overuse of antibiotics has often been linked with increased organism resistance [3,4]; for example, most cases of acute bacterial rhino-sinusitis (RS) are preceded by viral infection, further complicating the distinction [5]. The most common pathogens isolated from infected maxillary sinuses in adults are *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis* [6]. Bacterial RS, which is adequately treated by antibiotics, is suspected when symptoms worsen after five days or persist for longer than 10 days. Symptoms of less than 10 days of duration should generally be presumed to be viral acute RS, or common cold, which is normally self-limiting and does not require antibiotic use [7].

In some countries, it is possible to buy antibiotics from pharmacies without a prescription from a physician [8-10] despite regulations. In Syria, it is a very common practice. The Ministry of Health

passed a law (Number 2/T, dated 12/1/1988) that determined which drugs could be sold to individuals without a medical prescription and antibiotics were clearly excluded [11]. However, these regulations are not applied in the actual practice of pharmacies in Damascus, the capital of Syria. In our study, we determined the proportion of pharmacies in Damascus that sell antibiotics for acute rhino-sinusitis with neither medical prescription nor patient evaluations.

### Methodology

A cross-sectional study in pharmacies of the metropolitan area of Damascus city was conducted from September 12 to 17, 2008, and from January 28 to February 7, 2009. Damascus is the capital of Syria with roughly 1.7 million inhabitants [12]. There are 1,126 pharmacies [13] that are distributed in the five main areas (north, south, east, west, and centre) of the city [13,14].

To generate a sampling frame, a list of all pharmacies and their addresses was obtained from the web site of the pharmacists' syndicate, branch of Damascus [13]. After listing them alphabetically per

**Table 1.** Antibiotics sold without insisting and in total in Damascus, Syria.

Antibiotics	Number of antibiotics sold without insisting		Total number of antibiotics sold	
	N	(%)	N	(%)
Total	174	(100)	194	(100)
Amoxicillin + Clavulanic acid 1000	68	(39.0)	73	(37.6)
Amoxicillin	35	(20.1)	45	(23.1)
Amoxicillin + Clavulanic acid 625mg	20	(11.4)	25	(12.8)
Amoxicillin + Floxacillin	13	(7.4)	13	(6.7)
Cefodroxil	13	(7.4)	13	(6.7)
Clarithromycin	6	(3.4)	6	(3.0)
Azithromycin	5	(2.8)	5	(2.5)
Ciproflaxacillin	4	(2.2)	4	(2.0)
Cloxacillin + Ampicillin	4	(2.2)	4	(2.0)
Cefixime	2	(1.1)	2	(1.0)
Cefprodoxime 100mg	2	(1.1)	2	(1.0)
Cefprodoxime 200mg	2	(1.1)	2	(1.0)

area, one pharmacy for each five was selected in each area; therefore, a total of 224 pharmacies were selected. The number of visited pharmacies in each area was selected to reflect the total number of pharmacies in an area. No exclusion criteria were followed in the selection of pharmacies because pharmacies in Syria are small privately owned enterprises.

A simulated client methodology was used. The three investigators, who were medical and pharmacy students of the University of Damascus and the authors of this paper, visited the selected pharmacies. The investigators simulated having a sister who had sinusitis for one to two days of duration. The scenario was that the sick sister was at home, and her sibling visited the pharmacy asking for antibiotics for her. First, the investigators told the pharmacist: "My sister has flu, with fever, runny nose with clear secretion and a headache in the frontal sinus region. Could you give me an antibiotic for her?" If the attendant refused to give an antibiotic, or offered some medication other than an antibiotic, the collaborator would insist: "She is very sick, could you please give me an antibiotic?" In case the attendant asked specific questions, the investigators gave additional information: the sick sister was 20 years old; she had no other symptoms; she had no regular medication use; she had only used antipyretic drugs and the fever had returned hours after; she did not see a doctor; and the sibling did not recall her having any allergies. In the end of the simulated situation, the investigator would tell the attendant that no money was available at the moment to buy the antibiotic and the investigator would come back to pick it up later.

During the visit, no differentiation between pharmacy employees and pharmacists was done. After leaving the pharmacy, the investigator recorded whether the attendant prescribed an antibiotic with or without insistence, the type of antibiotic, and whether the attendant refused to give the antibiotic. Each pharmacy was visited only once and the investigators visited approximately 110 pharmacies in each period due to logistics.

## Results

From the 224 pharmacies selected, 200 (89.3%) pharmacies were open and were visited. The other 24 were closed and therefore did not participate in the study. Out of the pharmacies visited, 174 (87%) sold antibiotics without insistence, 20 (10%) accepted with insistence, and only 6 (3%) refused to give antibiotics without prescription.

The most common antibiotics offered by the 194 pharmacies were amoxicillin + clavulanic acid 1000 mg; amoxicillin; amoxicillin + clavulanic acid 625 mg; amoxicillin + floxacillin, and cefodroxil (Table 1).

## Discussion

This is the first systematic study showing the improper dispensing of antibiotics in pharmacies of Syria with neither a prescription nor a diagnosis from a physician.

The percentage identified in our study was higher than those found in other countries. A study performed in Brazil, for example, reported that 58% of the 107 approached pharmacies sold an antibiotic without insistence from the collaborators. The same study also reported that when the antibiotic was

denied and the collaborators insisted, the sale of antibiotics increased by 16% [10]. In another study conducted in Greece, actors simulated cases of rhinosinusitis, and an antibiotic was obtained in 70% of the approached pharmacies [15].

In the present study, the collaborators asked directly for an antibiotic because the purpose was to show how antibiotics were sold when no prescription was provided and no justification for taking an antibiotic was present. The investigators insisted on obtaining an antibiotic when the pharmacist refused in order to indicate the effect of persistence on obtaining an antibiotic when it is not clearly needed. We recognize, however, that this method could have increased the number of offers of antibiotics by the attendants. Another limitation of our study was that no differentiation was made between whether it was an attendant or pharmacist who agreed to dispense the antibiotic without a prescription.

A first step to change the situation was the institution of a federal regulation that prevents antibiotics from being sold without a medical prescription. However, other efforts should be taken because most pharmacies do not adhere to the regulation. One possible strategy might be to create health education programs about the dangers of misusing antibiotics that are directed both to the population as well as to the pharmacists and attendants.

Preventing the sale of unprescribed antibiotics can be a way to inhibit both bacterial resistance, a worldwide health problem, and the unnecessary adverse reactions and allergies caused by antibiotics. In Syria, more studies should focus on of the relationship between irrational use of antibiotics and the possible increase in bacterial resistance to antibiotics.

In conclusion, there is an irrational dispensing of antibiotics in the pharmacies of Syria. Health education programs may result in accurate treatment of patients and the prevention of antibiotic overuse and bacterial resistance.

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