

## Use of Antibiotics Without Medical Prescription

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The inappropriate use of antibiotics for the treatment of infections is a worldwide problem that has implications for the cost of treatment and the development of resistant strains of bacteria. The use of antibiotics should follow specific criteria; they are on top of the list of self-medication drugs in countries that do not control their commercialization. **Objectives:** To determine the percentage of pharmacies that attend the public and sell antibiotics without medical prescription in a medium-sized city in Brazil, and analyze the variables involved in this procedure. **Materials and Methods:** 107 of the 136 pharmacies registered in our city were evaluated. These pharmacies were visited by actresses who simulated having a sister with symptoms of a non-complicated rhino-sinusitis, so that they could obtain antibiotics without a medical prescription. Each pharmacy was visited only once; the only variable in the simulated clinical setting was the report of fever temperature, which was randomly assigned between 38.5 and 40 degrees Celsius. **Results:** Antibiotics were offered in 58% of the pharmacies, and this offer was increased to 74% after the actresses insisted on having them. In 65.4% of the pharmacies, the actresses were attended by a pharmacist, and 84.2% of them said they would sell antibiotics. When the request for antibiotics was denied (26%), only 7.5% was due to absence of prescription. The most frequent reason for refusal to sell antibiotics, was because the attendant deemed it unnecessary (46.6%) **Conclusion:** Antibiotics can be easily bought in the great majority of the pharmacies in our town without a medical prescription and a clear indication. Fever temperature did not modify the attendant's indication of the drug.

**Key Words:** Antibiotics, inappropriate use, medical prescription, pharmacies, ANVISA.

The inappropriate use of antibiotics for the treatment of patients with common infections is a worldwide problem, with implications for increasing treatment costs and selection for antibiotic-resistant organisms [1]. Outpatient use of antibiotics accounts for approximately two-thirds of antibiotic sales in the world, and therapy for respiratory tract infection results in three quarters of a billion prescriptions annually [2].

In Brazil, ANVISA (National Agency of Sanitary Surveillance) is the organ that regulates the use of drugs. Current regulations state that antibiotics cannot be sold

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without a medical prescription. Resolution number 138 of May 29, 2003 states, in its second article: "All drugs involving therapeutic groups and therapeutic indications that are not described in GITE (list of specific groups and therapeutics) must be sold exclusively with a medical prescription". Antibiotics are not included in GITE [3].

Acute rhino-sinusitis is frequently a viral syndrome and is self-limiting. There is no evidence that antibiotic use offers any advantage in the treatment of this syndrome when the probability of bacterial infection is low. Treatment with antibiotics is generally not recommended when symptoms have only been present for two days, or less, and the probability of bacterial infection is also low in the absence of high fever [4,5]. The objective of this paper was to determine the percentage of pharmacies that sell antibiotics without a medical prescription, and to analyze the variables of this procedure with a simulated acute rhino-sinusitis.

## Materials and Methods

A cross-section study involving 136 pharmacies was conducted from December 10–17, 2002, in Joinville, Santa Catarina, Brazil, an industrial city with approximately 500,000 inhabitants.

The list of pharmacies for this study was obtained from the Municipal Secretary of Health, at the division of sanitary surveillance, including all pharmacies that had legal permits to function in November 2002. We excluded homeopathy pharmacies and pharmacies that sold only manipulated drugs. The remaining pharmacies were grouped according by district; there were 27 districts. The distribution of the pharmacies in the different districts was made so that we had approximately the same number of pharmacies per temperature per actress. Actress number one visited 34 pharmacies, with an indication of 38.5°C, and 34 pharmacies with 40°C. The same numbers were assigned to actress number two.

Both actresses simulated being a long-time client of the pharmacy. They said they had a sick sister at home, and suggested an acute, uncomplicated rhino-sinusitis with two days duration (which they had been previously trained to do). For the treatment of this disease, the attendants (pharmacist or attendant) were questioned about the possibility of selling an antibiotic without medical prescription, and without even knowing the alleged sick patient.

The actresses (researchers) who visited the pharmacies were medical students at Univille (University of the Region of Joinville). They used a previously-established routine so that the actresses had the same attitudes and explanations. They were trained during three days previous to their visits.

Initially, the actress said to the attendant: "My sister has a strong flu, with fever (38.5°C or 40°C, previously randomized), and a headache right here (she pointed to the frontal sinus region). Could you indicate an antibiotic? If the attendant suggested an antibiotic, the actress would ask: "Is this the strongest one you have?" If the attendant said that there was a "stronger" one, the actress would ask for it. If he said there wasn't anything "stronger", the actress would

insist: "She is really in bad condition, could you please give me something stronger?" If no antibiotic was offered, or if the attendant gave some medication other than an antibiotic, she would insist: "She is very sick, could you please give me an antibiotic?" Additional information was given to the actresses, in case the attendant asked specific questions. These were: her sister's age was 20; she had no other symptoms; sporadically she had these symptoms in the past; the symptoms had a duration of two days; she had a "runny nose", with clear secretion; she had used antibiotics in the past (could not remember which); no regular medication use; she had only used antipyretic drugs, and the fever had returned hours after; she did not see a doctor; and she had taken no X-rays. In case she was questioned about "allergies", she would answer: "I think she has none". She would not demonstrate any concern about the price of the antibiotic, and when everything was "solved" she would say: "I have no money right now, but I will tell my aunt to come pick it up in just a while, thank you very much". And finally, she would ask the attendant's profession: "Are you a pharmacist?" After she left the pharmacy, she would fill in the protocol.

## Results

Of the 136 pharmacies that were registered by the Sanitary Surveillance Department, 107 were visited (87.7%), 8 were not found, 9 had closed, 7 had changed address, one was exclusive for diabetic patients, and 4 were homeopathic pharmacies.

Fifty-three pharmacies were visited by actress one, and in 28 pharmacies she said that her sister had a temperature of 38.5°C, and in 25 she said she indicated 40°C. Actress two visited 54 pharmacies, saying that her sister had a temperature of 38.5°C in 26 and 40°C in the other 28.

In 74% of the pharmacies, the actresses were able to obtain antibiotics. In 58%, no insistence was necessary. Insisting once or twice when the antibiotic was denied resulted in a 13% and 3% reversal of the denial, respectively. Hence, in only 26% of the

pharmacies antibiotics could not be obtained without a medical prescription.

There was no significant difference in the success rate of "obtaining" antibiotics by the actresses, since actress number one obtained 52% and actress number 2, 48%.

In 70 of the pharmacies, the attendant said he was a pharmacist, and in 37 of them they said they were just sales clerks. Among the pharmacists, 84% would sell antibiotics, and 57% of the clerks would do so; there was a significant difference ( $p < 0.01$ ).

At the pharmacies in which antibiotics could be obtained, amoxicillin was the most indicated, with 74% ( $n=46$ ). The remaining antibiotics offered are summarized in Table 1.

When the actress asked for a stronger antibiotic, there was a positive response in 14% of the pharmacies. The level of simulated fever did not alter the offer of antibiotics; when the simulated fever was 38.5° C, 49% offered antibiotics, and with 40° C, 51% offered them.

When there was a refusal to sell antibiotics, the most frequent reason was that the attendant deemed it unnecessary (21 pharmacies or 47%). The lack of medical consultation or prescription was the fourth-most-frequent reason for not selling antibiotics, involving 8 pharmacies (18%).

Among all the pharmacies that were visited, 11% recommended that the actress seek medical evaluation for the sister's disease. This percentage was slightly higher (16%), when we consider only the pharmacies in which the actresses were attended by sales clerks.

## Discussion

A study that was done in Brazil by Arrais et al. about self-medication showed that antibiotics occupy third place in a list of drugs used with this objective [6]. Our study reinforces this conclusion, since even without a medical prescription or consultation, antibiotics could be obtained in 74% of the pharmacies we visited, characterizing self-medication.

Fever should have called the attention of the attendant to denote a possible bacterial infection.

Possibly, there was no difference in their attitude due to a lack of knowledge on this subject.

In other studies, with similar objectives, the actor simulated the disease. In our study the actresses simulated a sick sister, who was not actually seen by the attendant. This fact by itself should have inhibited antibiotic sale, but that did not happen, as we were able to obtain offers of antibiotics at a similar rate to the "sick actor simulation" [7,8].

The significant difference obtained in our study, indicating that the pharmacists would sell antibiotics more readily than the sales clerks was not observed in the study made by Campos et al., in which the clerks were significantly more likely to sell antibiotics [9]. This might be because we obtained the information about profession directly from the attendant, and we did not obtain confirmation of this information.

## Conclusion

We conclude that 74% of the 107 pharmacies that we visited, which comprise 88% of the pharmacies in Joinville that are registered by the Municipal Health Secretary, will sell antibiotics without a medical prescription or consultation. The degree of fever did not influence the attendant's attitude. Pharmacists sold more antibiotics without a prescription than clerks. Insisting resulted in an additional 16% antibiotic sales. When a "stronger" antibiotic was asked for, it was offered in 17% of the cases.

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**Table 1.** Frequency of antibiotics obtained at pharmacies without a prescription

Antibiotic	Frequency	
	N	%
Amoxicillin	46	74.3
Azythromycin	6	9.6
Trimethoprim - sulfamethoxazole	5	8.1
Cephalexin	2	3.2
Erythromycin	2	3.2
Ampicillin	1	1.6
<b>Total</b>	<b>62</b>	<b>100</b>

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