Study of clinical pharmacy on children prescriptions containing antimicrobial drugs, in community pharmacy

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REZUMAT

Scopul acestui studiu este de a stabili incidenţa prescrierii medicamentelor antimicrobiene la copiii cu vârsta între 0-18 ani, de a evidenţia cele mai prescrise antibiotice şi chimioterapice şi de a analiza corectitudinea prescripţiilor medicale.

Am analizat un număr de 1269 de prescripţii medicale pentru copii, eliberate în lunile iulie şi octombrie 2005 în două farmacii de comunitate din Bucureşti.

Din 1269 de prescriptţii analizate, 593 au conţinut un antibiotic sau un alt antimicrobian chimioterapeutic (46,73%). Infecţiile cu cea mai largă răspândire în rândul populaţiei au fost cele respiratorii (79,42%), urmate de cele otorinolaringologice (6,57%). În ceea ce priveşte tipul de medicament prescris, penicilinele au fost folosite în 52,95% dintre cazuri, cefalosporinele în 23,44%, iar macrolidele în 10,11% dintre cazuri.

ABSTRACT

The aims of our study are to establish the incidence of prescriptions for children (aged 0-18 years) containing antibiotics and chemotherapeutic drugs, to find out what are the most prescribed drugs of this kind and to analyze the correctness of the prescriptions containing antimicrobial drugs.

We analyzed 1269 children prescriptions dispensed in July and October 2005 from two community pharmacies in Bucharest.

From 1269 analyzed prescriptions, 593 contained antibiotics or other antimicrobial chemotherapeutic drugs (46,73%). Respiratory infections had by far the highest occurrence (79,42%), followed by otolaryngological infections (6,57%). Concerning the type of drugs prescribed, the penicillins were used in 52,95% of cases, cephalosporins in 23,44% and macrolides in 10,11%.

• *antibiotic and chemotherapeutic drugs*
• *children prescriptions*
• *community pharmacy*

INTRODUCTION

Our study is a clinical pharmaceutical one, about the antibiotherapy in children, and was performed in two community pharmacies from Bucharest. We selected this topic being aware of large prescribing of antibiotics and chemotherapic drugs in children under 18. Antibiotherapy in children represents a challenge for both physicians and pharmacists, knowing the wide spread of infections among this category of patients.

In many situations, the antibiotherapy is empiric, not in concordance with antibiogram results. This therapeutic approach conducted to microorganisms' resistance to many antibiotics

and chemotherapics. For this reason, the pharmacist's role in community pharmacy is more important, in order to minimize this phenomenon. The pharmacist has to implicate himself in a competent and careful analysis of the medical prescriptions, for establishing diagnostic-treatment concordance, discovering posological errors, identifying incompatibilities between the prescribed antibiotic and other drugs simultaneously administered. ❑

METHOD

We designed a retrospective study, based on collecting children prescriptions containing antibiotics and chemotherapeutic drugs. The prescriptions came from two community pharmacies from different districts of Bucharest, Romania, and they were dispensed in July and October 2005.

The prescriptions containing antimicrobial agents were classified according to infection's localization, the type of chemotherapeutic drugs prescribed to manage the infectious disease and the age of the children.

We analyzed the prescriptions following the next parameters:

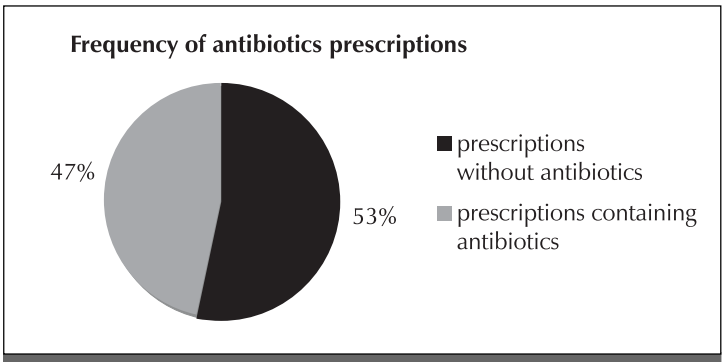
- Appropriateness of the used drug, related to the localization of the infections, knowing the most frequent etiological agents which provoke that kind of infections;
- Correctness of posology (dose, schedule of administrations, treatment duration), related to type of infection, its gravity and the age of the children;
- Possible interactions between the antimicrobial drugs and other simultaneous administerred drugs;
- Particular circumstances suggesting that a particular drug should have not been used in the case in question (drugs contraindicated under a specified age).

Our next aim was to look out for the frequency of antimicrobial drugs prescribed and to compare the tendency of their prescribing and dispensing in these two pharmacies taking part in our study.

In listing our results, we referred to the number of prescriptions containing antimicrobial drugs dispensed by both pharmacies and by each pharmacy separately. ❑

RESULTS AND DISCUSSIONS

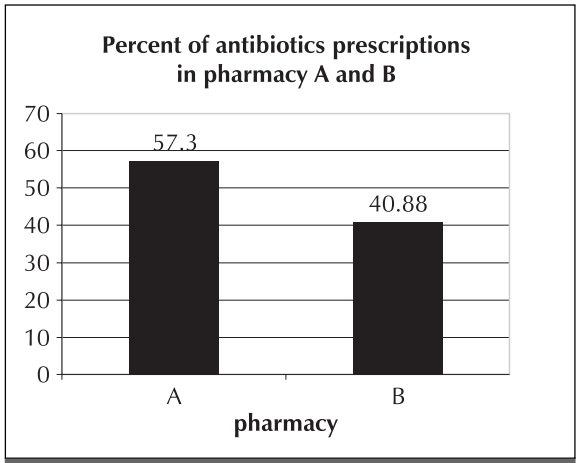
From 1269 analyzed prescriptions coming from both pharmacies, 593 contained antibiotics or other antimicrobial chemotherapeutic drugs (46,73%).



Graphic 1. Frequency of antimicrobial drugs prescribing

We noticed the high percent of prescriptions containing one or more antibiotics. This wide prescribing is not always based on antibiogram results and can lead to an alarming growth of microbial resistance to antibiotics and chemotherapic drugs.

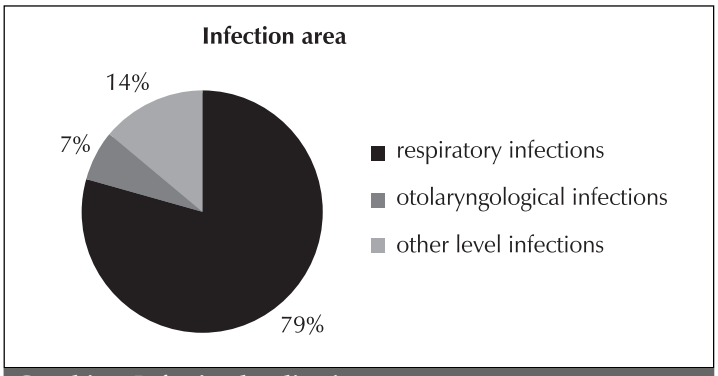
In one of the pharmacies (pharmacy A), the percent of prescriptions with antibiotics is 57,30% from all prescriptions for children under 18 years, comparing the other pharmacy (pharmacy B), where the percent is 40,88%.



Graphic 2. Frequency of antimicrobial drugs prescribing, reported to individual pharmacy

Regarding the infection localization, the maximum prevalence is at the respiratory tract (79,42%), followed by the otolaryngological one (6,57%), the infections at other levels (urinary tract, gynecological tract, digestive tube, eye, skin), in a total of 13,99%, being less frequent.

Next table presents the comparison between pharmacy A and B concerning the disease localization.



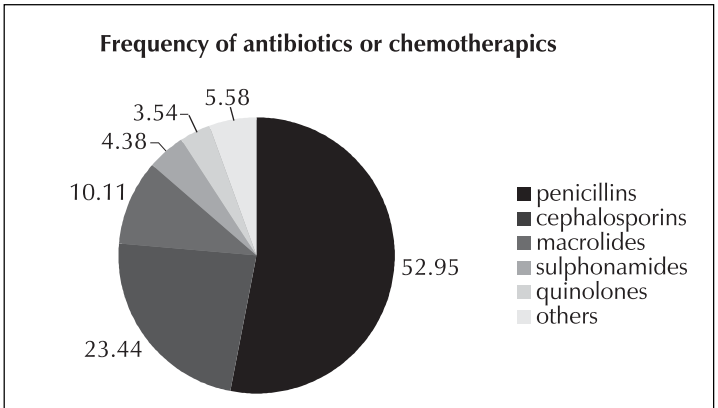
Graphic 3. Infection localization

Table I. Infection localization and frequency

Infections	Frequency (%)	
	Pharmacy A	Pharmacy B
respiratory	76.44	81.73
otolaryngological	5.79	7.18
skin and mucous membrane	5.4	2.4
urinary	2.3	2.69
digestive	2.7	1.8
gynecological	0.39	0.3
ocular	1.54	1.5
teeth	0	0.9
infections with multiple localizations	4.6	1.5

The respiratory infections, including tracheitis, bronchitis, pneumonia or these combined, were by far the most frequent, due to their high contagiousness.

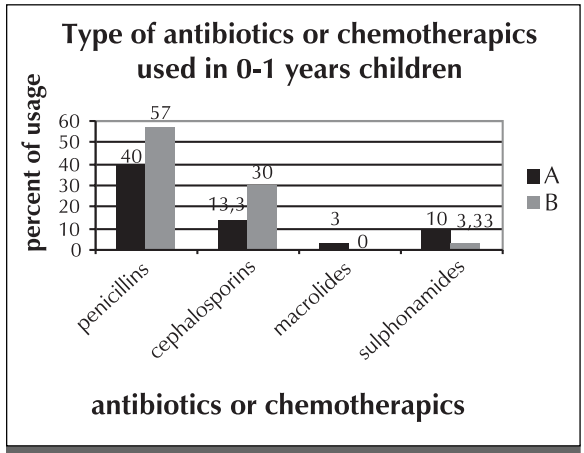
Concerning the type of prescribed antibiotic, penicillins were the most used, in 52,95% of all cases, cephalosporins in 23,44%, macrolides in 10,11%, sulfonamides in 4,38%, quinolones in 3,54%, the other classes of antibiotics or chemotherapics being prescribed less than 3%.



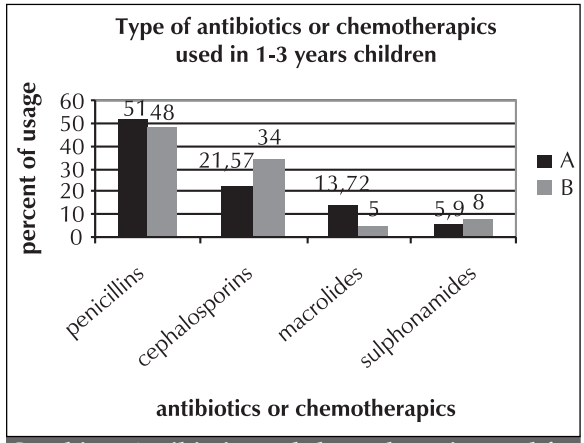
Graphic 4. Classes of most prescribed antibiotics

The results were in concordance with our expectations, knowing the fact that penicillins and cephalosporins are generally well tolerated, with less adverse reactions than other classes of antibiotics. Macrolides are mostly used in case of hypersensitivity to penicillins or cephalosporins. They are incriminated in more digestive adverse reactions, such as nausea and abdominal discomfort.

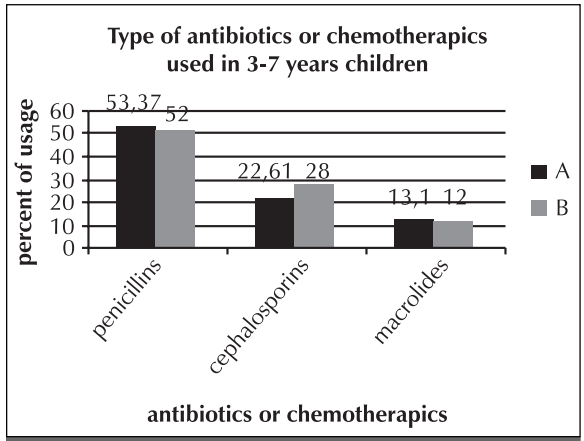
We analyzed the prescribing tendency on four different age groups: 0-1 year, 1-3 years, 3-7 years and 7-18 years. The results, comparing the prescriptions dispensed in pharmacies A and B, are presented in the following graphics.



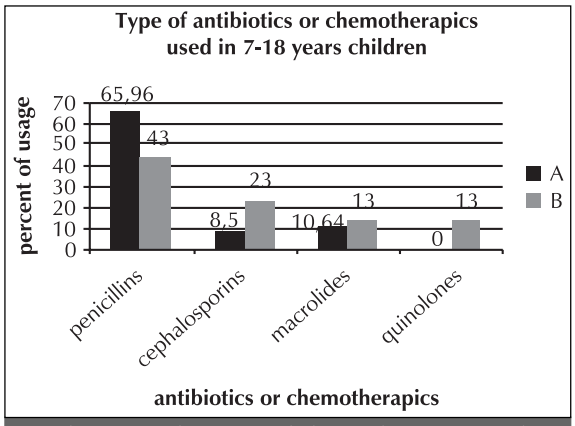
Graphic 5. Antibiotics and chemotherapics used for 0-1 year children



Graphic 6. Antibiotics and chemotherapics used for 1-3 year children

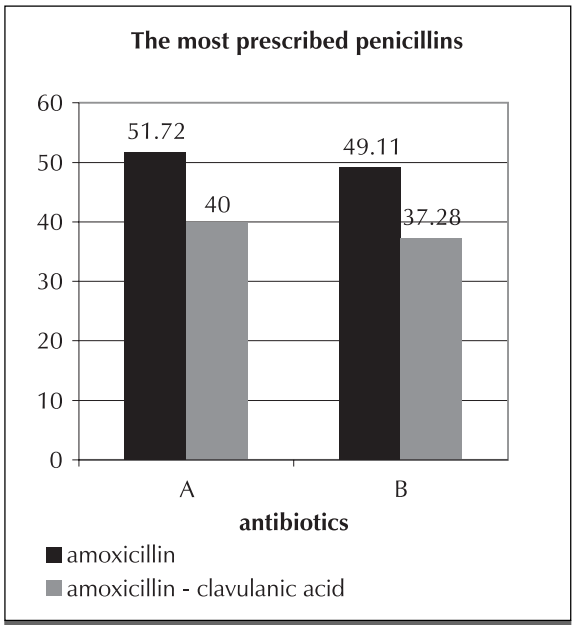


Graphic 7. Antibiotics and chemotherapics used for 3-7 year children



Graphic 8. Antibiotics and chemotherapics used for 7-18 year children

Among penicillins, amoxicillin was the most prescribed (50,32%), followed by the association amoxicillin with clavulanic acid (38,53%). The percent are very closed between pharmacy A and B.



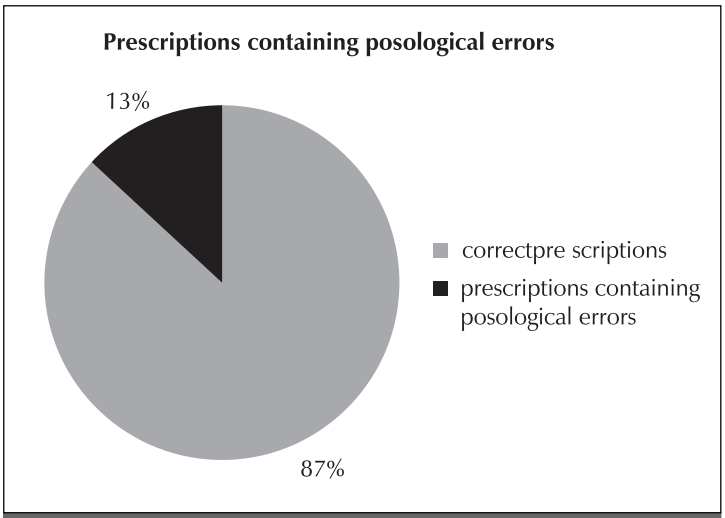
Graphic 9. The most prescribed penicillins in pharmacies A and B

The advantages of amoxicillin versus other penicillins are the cause of its wide prescribing. Among the advantages there are higher bioavailability after oral administration, improved kinetic profile comparing ampicillin, wide spectrum of action, low toxicity.

The most frequent prescribing errors were related to posology; so, in 12,98% of prescriptions we found dosage errors or inappropriate administration schedule.

Example of dosage error: suspension of amoxicillin in concentration of 250 mg/5 ml was prescribed at a 10 months child, for an moderate respiratory infection, in dose of 5 ml three times daily, totalising 750 mg/day. The dose was too high.

Examples of inappropriate administration schedule: azythromicyn was prescribed for acute pneumopathy in 4 years child, at 8 hours instead of 24 hours; ciprofloxacin was prescribed for pharyngitis in 18 years child at 8 hours, instead of 12 hours; co-trimoxazole was prescribed for diarrhea in 3 years child at 8 hours instead of 12 hours.



Graphic 10. Frequency of posological errors.

CONCLUSIONS

Our study highlighted the intensive use of antimicrobial drugs in children, their prescribing frequency being similar for both community pharmacies from where we collected the prescriptions. We noticed that that penicillins are in both pharmacies the most prescribed antimicrobial drugs, due to their low toxicity and their effectiveness in community infections of medium gravity.

We think that community pharmacist is a key factor in providing a correct and effective antimicrobial therapy, by investigating diagnostic – treatment concordance, detecting prescribing errors and offering solutions for those errors. ❑

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