

## SPECIAL CONSIDERATIONS REGARDING THE SIDE EFFECTS OF ANTIBIOTICS ADMINISTERED TO THE INSTITUTIONALISED ELDERLY PEOPLE

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### RESUME

*En raison d'une insuffisance du système immunitaire, aînés sont prédisposés aux super infections. La présence simultanée des maladies des organes principaux impliqués dans le métabolisation et l'élimination des drogues détermine l'augmentation de la demi vie du plasma et du risque de toxicité (effets secondaires) en administrant des antibiotiques aux aînés.*

**MOTS CLES:** *les effets secondaires, antibiotiques, personnes âgées institutionnalisées*

### 1. Introduction

Consequences of organism aging:

#### A. Functional modifications:

- the functioning of all organs diminishes;
- a reduction in the sensibility of receptors with age and even a reduction in the number of receptors;
- psycho-sensorial modifications-memory disorders, senile tremor, vision disorders. All these facts expose the patient to error in dosage of medication;
- frequent polimedication-the cause for accidents brought by the interaction of medicines.[1]

**B. Pharmacokinetics modifications specific to elderly people are [2] :**

- a slower rate in the absorption of medicines ( ex. Tetracycline has T50 for young people of 3.5h and 4,5h in the case of elders) [3] ;

- a reduction in the fixation of medicines on the plasma albumin (with the increase in the medically free fraction);

-the modification of the distribution volume of medical substances;

A decrease in the renal elimination of medicines (aminoglycozide);

- a slower rate in the meatabolization of medicines due to a reduction in the hepatic mass (number of hepatocytes) and in the hepatic microsomal enzymes (Antibiotics which are biliary eliminated : ampicillin).

The alterations mentioned impose a reduction in the medicine dosage which can be made through:

- less frequent administration;
- the reduction of the daily dosage of the medicine but maintaining the administration rhythm.

The adverse effects of antibiotics experienced by elderly people are no different from those observed at other age groups, but their frequency of manifestation is higher due to the associated present diseases.

## 2. Material and method

An analysis of the establishment and evolution of the antibacterial antibiotherapy has been carried in the case of 114 institutionalised elderly patients in two care homes in Galati, treated between 2006 and 2008 for respiratory and genitor-urinary diseases, cutaneous, stomatological, ORL etc infections. The data has been taken from the patients' individual observation sheets regarding: the diagnosis, the choice of antibiotic, dosage, type of administration, length and control of treatment, the connection between the acute disease and associated illnesses, the medication history for other illnesses, the response to treatment.[4]

## 3. Results

In the period of time between 2006-2008 at the two nursing homes 372 check-ups had been carried, antibiotics being subsequently prescribed as follows (figure 1):

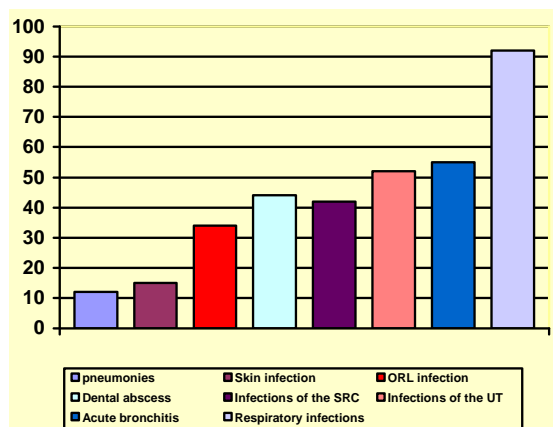
- in 42 cases with the diagnosis chronic obstructive bronchopneumopathy;
- in 55 cases with the diagnosis of acute bronchitis;
- in 12 cases with the diagnosis Pneumonia;
- in 92 cases with the diagnosis infections of the superior respiratory channels;

-in 52 cases with the diagnosis infections of the urinary tract;

-in 44 cases with the diagnosis dental abscess;

-in 34 cases with the diagnosis ORL infections;

-in 15 cases with the diagnosis of skin infections.



**Figure 1.** Medical pathology encountered in the two nursing - homes

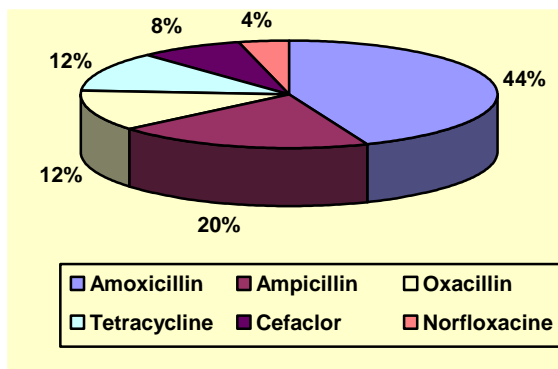
We can observe that respiratory infections are most frequent at elders comparatively to other infections. The etiology of these infections is mostly viral a wide series of serotypes being involved. The streptococcus beta-hemolytic A type is responsible for 5 to 10% of the faryngitis cases in adults. Streptococcus pneumoniae, Haemophilus influenzae si Moraxella catarrhalis are the most frequent agents which determine bacterial suprainfections of the acute viral sinusitis.

In the two nursing homes, 55 check-ups have been carried which resulted in an acute bronchitis diagnosis. The following antibiotics have been recommended (figure 2):

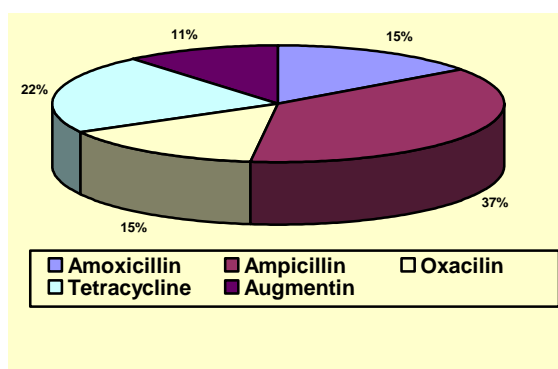
- in 22 cases: Amoxicillin for 5 to 7 days;
- in 10 cases: Ampicillin for 7 to 10 days;
- in 6 cases: Oxacillin for 5 days;
- in 6 cases: Tetracycline for 5 days;
- in 4 cases: Cefaclor for 5 days;
- in 2 cases: Norfloxacin for 7 days and in just one case, following the tetracycline treatment nausea and

vomiting appeared and the treatment was interrupted after 3 days.

Although in most cases they are self-limited, they represent a casuistry which raises numerous problems among family physicians, especially when it is aggravated by infections of the lower urinary tract. They represent the most frequently encountered disease in general medicine practice. These can envisage a large area of clinical forms, from the common cold, catarrhal syndrome of the nasal-pharynx, sinusitis, to laryngitis, epiglottitis or tracheatitis (figure 3).



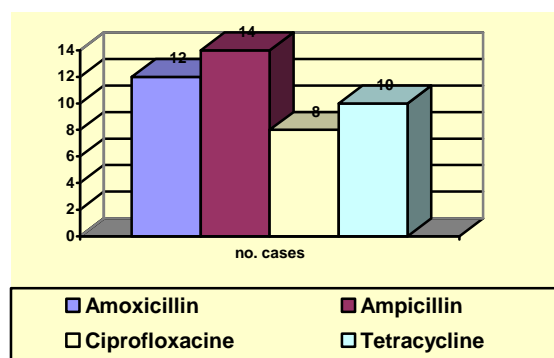
**Figure 2.** The amount of antibiotics used in the case of acute bronchitis



**Figure 3.** The amount of antibiotics used in the case of infections of the superior respiratory channels.

Patients over 65 and those with comorbidities are exposed to a greater risk of being hospitalized and death compared to the healthy population - especially

due to the acute infection of the upper respiratory channels as a result of the aggravation of subjacent medical concerns because of infection with influenza virus. [5] The study resulted in a very high usage of Ampicillin 37% and Tetracycline 22% , even though the period of treatment was a short one of 3 – 5 days, suggesting the viral character of this condition and the fact that antibiotic therapy was done also due to the psycho-emotional modifications which appear to elders .



**Figure 4.** The amount of antibiotics used in chronic obstructive bronchopneumopathy

Cases of chronic obstructive bronchopneumopathy appeared after 44 examinations and the following antibiotics were prescribed (figure 4):

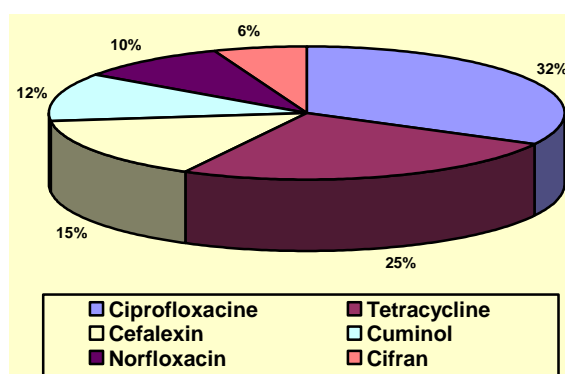
- in 14 cases: Ampicillin for a period of 7 to 10 days, but the treatment did not work so Cefaclor was prescribed for 7 more days;
- in 10 cases: Tetracycline;
- in 12 cases: Amoxicillin - only in one case the medication was stopped after 5 days because of epidermal rash and the use of antibiotics was discontinued ;
- in 8 cases: Ciprofloxacin.

Treatment of urinary infections in the case of elders must also not be neglected. Many times, they lead to bacterial multiresistance. In the case of the two nursing homes the treatment was empirical on account of the lack of possibilities to perform

urocultures and of the reduced medical possibilities. [6]

In the period between 2006 and 2008, 52 cases of infections of the urinary tract have been registered. The subsequent treatment was as follows (figure 5):

- in 17 cases –Ciprofloxacin administered 7-10 days;
- in 13 cases -Tetracycline administered 5 days;
- in 8 cases Cefalexin administered 5 days;
- in 6 cases -Cuminol administered 5 days;
- in 5 cases -Norfloxacin administered 7 days;
- in 3 cases -Cifran administered 7 days.



**Figure 5.** *The percentage of antibiotics in the case of infections of the urinary tract*

We may notice that fluoroquinolones (Ciprofloxacin, Cuminol, Cifran, Norfloxacin) have been prescribed in proportion of over 60% and in a single case gastro-intestinal disorders have been noticed after 5 days of treatment.

In nursing homes, the purchase of inexpensive, common drugs is predominant; Due to the fact that there are no identification conditions for pathogen germs, a "first intention" treatment is most commonly initiated with a length of 3 to 4 days after which, the symptomatology having improved, the patient refuses further medication. In these situations, infections may chronicize; the most frequent adverse reactions to antibiotics have consisted of digestive disorders (6%) registered when using doxycycline and ciprofloxacin – nausea, vomiting, gastralgia;

allergic reactions to trimetoprim sulfametoxazol – allergic rashes on the face, macular allergies on inferior and superior limbs and abdomen.[7]

#### 4. Conclusions

The most feared side effect is the resistance to antibiotherapy. Performing an antibiogramme and guiding the antibiotherapy according to its results would make it more efficient. A cost-efficiency-safety analysis when purchasing new types of antibiotics is necessary. When deciding upon the treatment associated illnesses and prior medication should be considered.

The study resulted in the following conclusions:

The medical staff employed by these two nursing homes are not given the legal possibility to perform an adequate treatment. Every patient is registered at a family physician outside the home and cannot be monitored and treated effectively by him.

The doctor inside the home does not have at his disposal funds to correctly manage the patient disease due to the fact that he has no contract with the National Health Insurance House antibiotherapy in the case of elders must take into consideration age particularities and should be carried according to treatises of geriatrics and gerontology.

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