

ACINETOBACTER SPP. – PATHOGENIC ROLE AND RESISTANCE TO ANTIBIOTICS

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Abstract: *Acinetobacter* species represent an important cause of nosocomial infections, producing urinary tract infections, pneumonia, endocarditis, wound infections, septicemia, meningitis. *Acinetobacter* were more frequent implicated in wounds infections (50.9%) and respiratory infections (20.4%). The infections prevalence was bigger in the Orthopedy (19.4%), Intensive Care Unit (18.5%) and Plastic Surgery (14.8%) departments. Most of the isolated strains have belonged to the *A. baumannii* species (87%). Other *Acinetobacter* species that have been isolated during the study period were *Acinetobacter calcoaceticus* (11.14%), *Acinetobacter haemolyticus* (0.93%) and *Acinetobacter lwoffii* (0.93%). We obtained high percentages of resistant strains for all the tested antimicrobials, except carbapenems.

Key words: *Acinetobacter* species, pathogen role, resistance to antibiotics, nosocomial infections.

1. Introduction

The *Acinetobacter* genus includes emergent ubiquitous microorganisms widely distributed in nature. These bacteria are able to survive in different environmental conditions. They were isolated from water, soil, food, sewage, plants, living organisms and are components of human microbiota from oro- and nasopharynx, skin, colon, vagina) [2], [3], [5].

Some species of *Acinetobacter* are able to survive long periods on various surfaces, preferable dry. This aspect is very important in hospitals, because these strains can cause severe infections in compromised patients that are often fatal and generally expensive to treat. In this environment, *Acinetobacter* species were isolated from medical, water or

heating equipments and also from the hands of the medical personnel [2], [3], [5].

The *Acinetobacter* genus is a heterogenic group including 19 species, often considered to be opportunistic pathogens, nonpathogenic to healthy individuals. The most important for human pathology is *A. baumannii*, followed by *A. lwoffii*, *A. junii* and *A. haemolyticus*. The species *A. baumannii* is an important cause of nosocomial infections, especially in ICU producing urinary infections, pneumonia, endocarditis, wound infections, septicemia, meningitis, ocular infections [1], [2], [4], [7]. There were also reported community acquired infections with *Acinetobacter* spp. but these are rare [3], [7].

Studies regarding *Acinetobacter* pathogen role in various countries have illustrated that the most frequent infections were urinary and

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tracheo-bronchial. *A. baumannii* is the second most commonly isolated nonfermenting germ, after *Pseudomonas* spp. [3], [7].

The risk factors for the infection with *Acinetobacter* species are following: long period of hospitalization, catheter lines, intubation, previous antibiotic therapy with cephalosporins or fluoroquinolones. [3], [4], [5]

The treatment of infections determined by *Acinetobacter* spp. can be difficult because has intrinsic resistance to certain antibiotics and can acquire resistance to many others. During the last decade, nosocomial infections caused by multidrug-resistant *A. baumannii* have been reported. For the multiresistant strains of *Acinetobacter* spp., imipenem and meropenem are considered the most effective antimicrobial agents. Carbapenems are better against *Acinetobacter* than most other antibiotics, but carbapenemases have begun to emerge in the genus. Many studies have demonstrated that these germs are susceptible to sulbactam. [2], [3], [4], [5], [6].

The drugs with sulbactam are indicated in the therapy of severe infections produced by *Acinetobacter* spp. [6].

2. Material and Method

Our retrospective study has included 108 strains of *Acinetobacter* spp., isolated in the laboratory of the Clinical County Emergency Hospital of Braşov, between 1.01.2008 and 1.09.2008.

The objectives of the study have consisted in the evaluation of pathogenic role and antimicrobial resistance of *Acinetobacter* strains isolated in this medical unit.

3. Results and Discussions

Figure 1 presents the infections produced by *Acinetobacter* spp.

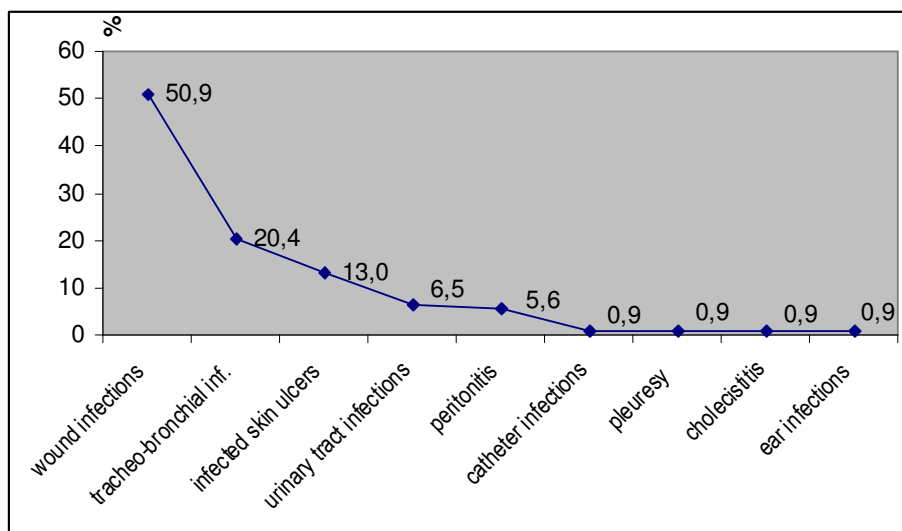


Fig.1. *Infections produced by Acinetobacter* spp.

Acinetobacter strains were more frequent implicated in wound and tracheo-bronchial infections.

During the study, we have also evaluated the distribution of *Acinetobacter* strains in the hospital, as shown in figure 2.

The infections were more frequent in the Orthopedy (19.4%), ICU (18.5%) and Plastic Surgery (14.8%) departments.

The great majority of isolated strains were *A. baumannii* (87%).

Other isolated *Acinetobacter* species were *A. calcoaceticus* (11.14%), *A. lwoffii* (0.93%) and *A. haemolyticus* (0.93%).

Figure 3 illustrates the sensitivity and the resistance to antibiotics of *Acinetobacter* spp.

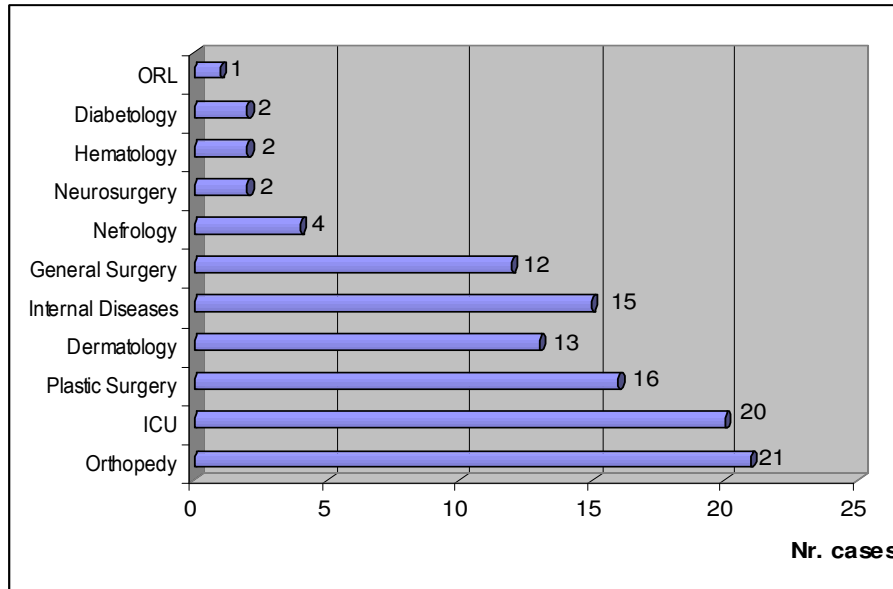


Fig. 2. The distribution of *Acinetobacter* strains in the hospital

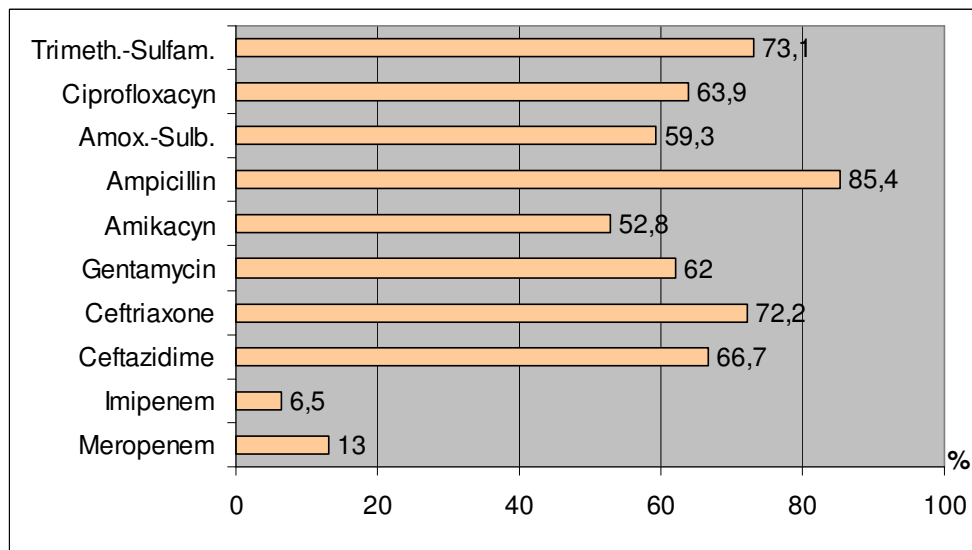


Fig. 3. Evaluation of antimicrobial resistance

4. Conclusions

1. Acinetobacter species were more frequent implicated in wounds infections (50.9%) and low respiratory infections (20.4%).
2. The prevalence of infections were bigger in the Orthopedy (19.4%), Intensive Care Unit (18.5%) and Plastic Surgery (14.8%) departments.
3. Most of the isolated strains have belonged to the *A. baumannii* species (87%).
4. Other Acinetobacter species that have been isolated during the study period were Acinetobacter calcoaceticus (11.14%), Acinetobacter haemolyticus (0.93%) and Acinetobacter lwoffii (0.93%).
5. We obtained high percentages of resistant strains for all the tested antibiotics.
6. The Acinetobacter isolated strains were more sensitive to imipenem (89.8%) and meropenem (64.8%).

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