Bulletin of the *Transilvania* University of Braşov • Vol. 3 (52) - 2010
Series VI: Medical Sciences

EVALUATION OF ETIOLOGICAL SPECTRUM AND THERAPEUTICALLY PROBLEMS IN VARICOSE ULCER INFECTIONS

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Abstract: *Varicose ulcers represent a major issue for both patients and health services being associated with impaired quality of patient's life and loss of work productivity. Many of these chronic wounds are associated with infections. The study group has included 662 bacterial strains isolated from secretions of the infected varicose ulcers of patients treated in the Dermatology department from the Clinical County Emergency Hospital Braşov between 2007 and 2008. The objective of our study has consisted in the evaluation of etiological spectrum of varicose infections and resistance to antibiotics of implicated microbes. The most frequent involved germ was Staphylococcus aureus (58.3%), followed by Enterobacter spp (14.8%) and Pseudomonas aeruginosa (9.5%). Lower frequencies of isolation were registered for Escherichia coli, Proteus mirabilis, Acinetobacter spp and Klebsiella spp. Various levels of bacterial resistance were registered for the tested antibiotics. .*

Key words: *varicose ulcer, infection, etiology, antibiotic resistance.*

1. Introduction

Varicose ulcer is defined as a loss of skin substance, located in the legs, usually on the internal side, with the affection of the epidermis, having a chronic and relapsing evolution, without tendency to spontaneous healing. [5]

Many studies showed that these chronic wounds are associated with high morbidity indicators.

Thus, it is estimated that, in developed countries, up to 1% of adult population is affected by this affection at some point in their lives. [6, 7]

In U.S.A., varicose ulcers affect annually 2.5 million patients. [1]

Lower legs ulcers represent an issue for both patient and health services [2, 8]

Although varicose ulcers are not usually fatal, they affect the quality of life of the patient through the associated morbidity and the substantial loss of productivity. [4]

The measurement of the impact of this disease is based on the clinical and economic evaluation of the patient. The studies have showed the importance of pain in changing the quality of life, being more intense among the elderly and often do not get healed. [3]. The care for these patients is expensive. [8]

Over 75% of the varicose ulcers of lower legs are due to venous system disorders, the remainder being the result of diverse causes like the arterial insufficiency, neuropathy, traumas, infections, and other. [9]

Etiopathogenesis of these diseases is varied, but most cases are an expression of chronic venous insufficiency. [4, 9]

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2. Method

The objective of our retrospective study has consisted in the evaluation of etiological spectrum of varicose ulcer infections and resistance to antibiotics of implicated germs.

The study group has included 662 bacterial strains isolated from secretions of infected varicous ulcers from the patients that were treated in the Dermatology department of the Clinical County Emergency Hospital of Braşov, in a 2 year period (01.01.2007 to 31.12.2008).

For the isolation of pathogen germs we have used culture media supplied by Oxoid - Columbia Blood Agar Base with 5 % sheep blood, Chromogenic Urinary Tract Infections, Candida Chromogenic Agar and MacConkey agar.

The identification of the isolated germs was done based on classical biochemical tests, with API galleries (Biomerieux, France) and with the automated system VITEK 2 COMPACT.

The testing for susceptibility to antibiotics of the implicated germs was made by using the Kirby-Bauer diffusimetric method and VITEK 2 COMPACT automated system.

The interpretation of the obtained results was conducted according to CLSI (Clinical and Laboratory Standard Institute) standard from 2007 and 2008.

3. Results and discussions

The first aim of our research has consisted in the evaluation of the etiological spectrum of varicose ulcers infections in patients included in the study, as shown in figure 1.

From the analysis of Figure 1, it can be observed that the etiologic spectrum of varicose ulcers infections was varied. The most frequently involved was Staphylococcus aureus (58.3%), followed by Enterobacter species (14.8%) and Pseudomonas aeruginosa (9.5%). With lower frequencies there were isolated Escherichia coli, Proteus mirabilis, Acinetobacter species and Klebsiella species.

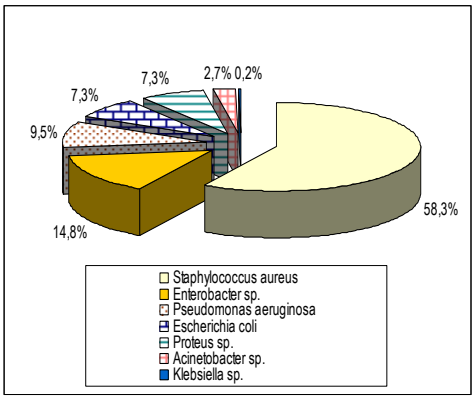

Fig. 1. *The etiological spectrum of varicose ulcers infections*

We have further analyzed the resistance to antibiotic of the isolated bacterial strains.

Figure 2 presents the results obtained for the Staphylococcus aureus strains.

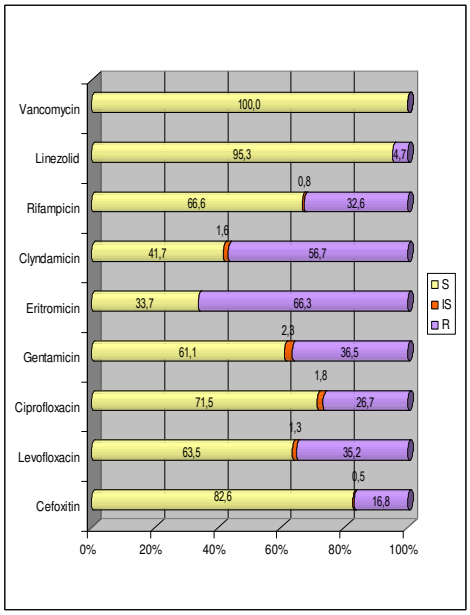

Fig. 2. *The resistance to antibiotics of Staphylococcus aureus strains*

It can be observed that the Staphylococcus aureus strains have retained their sensitivity to vancomycin and linezolid. For the other antibiotics, there were registered varying degrees of resistance.

Antimicrobial resistance for the isolated Enterobacter strains is illustrated by Figure 3.

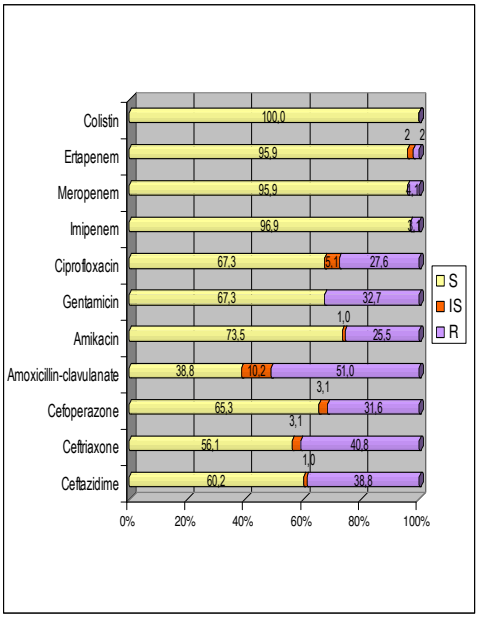

Fig. 3. *The resistance to antibiotics of Enterobacter spp. strains*

For the Enterobacteriaceae isolated strains, the tested antibiotics were ceftazidime (Caz), ceftriaxone (Cro), cefoperazone (Cfp), colistin (Co), amoxicillin – clavulanic acid (Amc), amikacin (Ak), gentamicin (G), ciprofloxacin (Cip), imipenem (Ipm), meropenem (Mem) and ertapenem (Etp).

Antimicrobial resistance for Escherichia coli strains is illustrated by Table 1.

In Table 2 are reported the obtained results for Proteus spp. They have natural resistance to colistin. Similarly, in Table 3 are the results regarding the antibiotic resistance for Pseudomonas aeruginosa strains. In this case, piperacillin-tazobactam (Tzp) has been also tested.

The number of Klebsiella species and of Acinetobacter species isolated strains were very small.

Table 1 – *Escherichia coli*

Antibiotics	**Resistant strains**	**Total strains**
Caz	5	48
Cro	8	48
Cfp	8	48
Amc	11	48
Ak	5	48
G	7	48
Cip	13	48
Ipm	0	48
Mem	0	48
Etp	1	48
Co	0	48

Table 2 – *Proteus spp.*

Antibiotics	**Resistant strains**	**Total strains**
Caz	10	48
Cro	13	48
Cfp	6	48
Amc	10	48
Ak	6	48
G	16	48
Cip	6	48
Ipm	0	48
Mem	1	48
Etp	1	48

Table 3 – *Pseudomonas aeruginosa*

Antibiotics	**Resistant strains**	**Total strains**
Caz	15	63
Cro	31	63
Cfp	18	63
Tzp	5	63
Ak	9	63
G	25	63
Cip	24	63
Ipm	1	63
Mem	1	63
Co	0	63

4. Conclusions

1. The etiological spectrum of varicose ulcers infections was wide.
2. The most frequent germ involved was S. aureus, followed by P. aeruginosa and Enterobacter spp.
3. For all the isolated germs, various levels of resistance to antibiotics were obtained, sustaining the necessity of antibiogram for therapeutical success.

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