STUDY ON THE EFFICIENCY OF ANGIOTENSIN CONVERTING ENZYME (ACE) INHIBITORS THERAPY IN A BATCH OF HYPERTENSIVE PATIENTS IN THE COUNTY OF ARGE□

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Keywords: *therapy, angiotensin enzyme inhibitors, efficiency*

Abstract: *The main objectives of this study is to demonstrate the effectiveness and efficiency of the therapy with ACE inhibitors on medium term (6 months) in the decrease of the systolic and diastolic blood pressure and to demonstrate the ACE inhibitors' influence on the level of total cardiovascular risk. The prospective study was performed in the Department of Cardiology within the County Emergency Hospital of Pite□ti, during 2009-2010, on a number of 357 patients. Clinical follow-up period was of 6 months. Although, the moment of patients' inclusion in the study was different, each patient was followed and treated according to the same operational plan. In defining the population of the county of Arges, I took into account the criteria of inclusion in the batch, respectively the exclusion criteria, as well as the criteria that required the premature interruption of the study.*

Cuvinte cheie: *terapie, inhibitori ai enzimei de conversie a angiotensinei, eficien□ ă*

Rezumat: *Demonstrarea eficacită□ii □i eficien□ei terapiei cu IECA, pe termen mediu (6 luni), în scăderea valorilor tensionale sistolice □i diastolice; Demonstrarea influen□ei IECA asupra nivelului riscului total cardiovascular; Studiul prospectiv s-a efectuat în sec□ia de Cardiologie a Spitalului Județean de Urgență Pite□ti, în perioada 2009-2010, pe un număr de 357 pacien□i din cazuistica sec□iei. Perioada de urmarire clinică a fost de 6 luni. Deşi momentul introducerii în studiu a fost diferit, fiecare bolnav a fost urmărit şi tratat după acelaşi plan opera□ional. Definirea populatiei arge□ene studiate a luat în calcul criteriile de includere, respectiv excludere din lot, precum □i criteriile ce au impus întreruperea prematură a studiului.*

OBJECTIVES OF THE STUDY

1. Primary objectives:

- Demonstrating the effectiveness and efficiency of the therapy with ACE inhibitors on medium term (6 months) on the decrease of the systolic and diastolic blood pressure;
- Demonstrating the influence of ACE inhibitors on the level of total cardiovascular risk;

2. Secondary objectives:

- Highlighting the effect of ACE inhibitors on LVH by remodelling prevention; left ventricular hypertrophy (LVH) regression method will be assessed by echocardiography, the main parameters of the left ventricular wall thickness and the diastolic function being followed; the consecutive improvement of the LV diastolic function will be assessed by transmitral Doppler parameters (wave amplitude E, wave amplitude, ratio E/A, E wave deceleration time, relaxation izovolumetric time).
- The assessment of the therapeutic response to ACE inhibitors in the patients with heart failure associated hypertension - clinically (exercise tolerance, assessed according to the New York Heart Classification (NYHA) echocardiographic method (LV dimensions, systolic function assessed by the ejection fraction, diastolic function, respectively the diastolic function evaluated by transmitral Doppler).
- The assessment of the influence of ACE inhibitors on diabetic hypertensive angiopathy in the hypertensive patients - by eye examination - fundus, vascular ultrasound (IMT-endothelial dysfunction).
- Demonstrating the effect of ACE inhibitors on microalbuminuria, as evidenced by the reduced proteinuria/urinary albumin at the same time with blood pressure control, supported by quantitative determination of microalbuminuria at the moment of the inclusion in the study and at the 6-month visit.

3. Tertiary objectives:

- assessment of tolerability and safety on medium-term for ACE (the presence of adverse reactions: type - cough, other reactions; severe - such as to indicate the discontinuation of the therapy);
- improvement of the hypertensive patient's quality of life, assessed by processing the data obtained from the application of a life quality questionnaire at the moment of the inclusion in the study and at the end of the study;
- socio-economic assessment of the therapy with ACE inhibitors in hypertensive patients - number of days of hospitalization, number of days of sick leave, number of hospitalizations.

MATERIAL AND METHODS

Defining the studied group

The prospective study was conducted in the Cardiology Department of the County Emergency Hospital of

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the county of Pitesti, between 2009 and 2010, on a number of 357 patients taken from the department. The clinical follow-up period was of 6 months. Although, the moment of inclusion in the study was different, each patient was followed and treated according to the same operational plan. In defining the population of the county of Arge□, I took into account the criteria of inclusion in the batch, respectively the exclusion criteria, as well as the criteria that required the premature interruption of the study.

The patients had hypertension at different stages according to the ESH/ESC 2007 criteria (1), with multiple vascular risk factors and associated diverse pathology. In the cases in which the systolic blood pressure (SBP) and the diastolic blood pressure (DBP) were classified into different categories, the rule of category was applied in order to quantify the higher cardiovascular risk and treatment decisions and in order to estimate the effectiveness of the treatment. Isolated systolic hypertension was also classified in one of the 1, 2 or 3 categories, depending on the values of SBP, although DBP was below 90 mm Hg, given that the association with diastolic low pressure is an additional risk factor.(2)

Figure no. 1. Batch prevalence regarding the total number of hypertensive patients admitted to the Cardiology Department within the County Emergency Hospital, Pite□ti

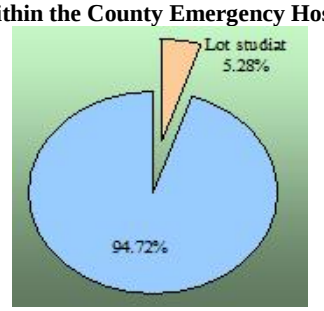
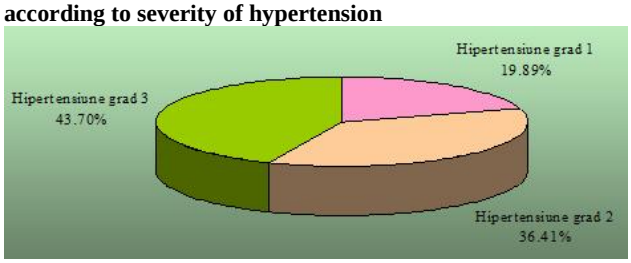


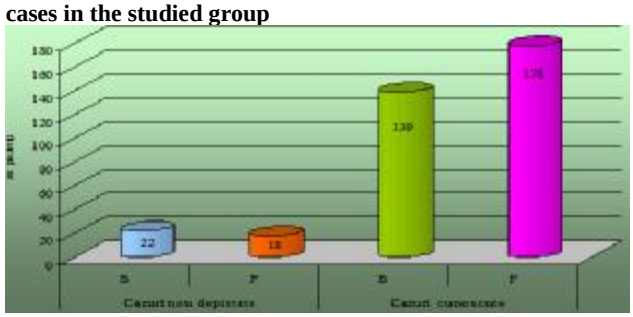
Figure no. 2. Distribution of the studied group of patients according to severity of hypertension



Hypertension categorization was made with the existing psychogenic component that causes the "white coat" hypertension that can be excluded by increasing the number of visits and measurements of the blood pressure, including at home.(3) There is a number of patients with 1 degree hypertension, which is significantly lower than the number of patients with hypertension grade 2 and 3 ($p = 0 < \alpha = 0.01$ z test). The number of patients with grade 3 hypertension is significantly higher than the number of patients with grade 2 hypertension ($p = 0.000000135 < z\ \alpha = 0.01$ test).

Having in view that the isolated systolic hypertension is an entity that can be classified in the same stages of hypertension, an analysis of the patients' batch was necessary to be undertaken. Thus, of the 357 hypertensive patients, 29 were identified with isolated systolic hypertension. Some of the patients were newly detected with hypertension, the rest being known with hypertension, but without a satisfactory control of the blood pressure due to the suboptimal treatment or to the non responding rate to the treatment.

Figure no. 3. Prevalence of hypertension newly detected cases in the studied group



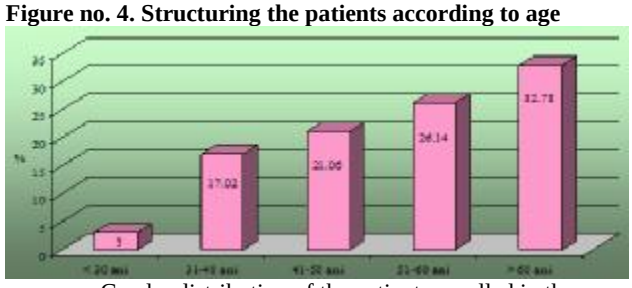
For the newly detected cases, the number of men is significantly higher than women ($p = 0.002391 < \alpha = 0.01$ z test). For the known cases, the number of women is significantly higher than men ($p = 0 < \alpha = 0.01$ z test).

Demographic profile of the study subjects

In order to characterize demographically the study subjects, I applied the following operational criteria: age structure, gender, backgrounds and education.

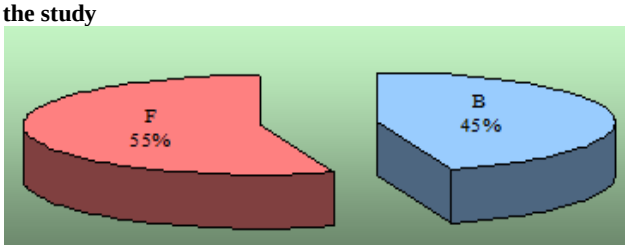
In terms of age of the patients in the studied group, the range of increased prevalence of hypertension appears to be similar to the literature data that is above the age of 60.(4)

Figure no. 4. Structuring the patients according to age



Gender distribution of the patients enrolled in the study is shown in the below chart:

Figure no. 5. Gender distribution of the patients enrolled in the study



The studied group is characterized by a mutual influence and interdependence relationship between age, sex and blood pressure values, that is hypertension prevalence to increase with age, with a slightly higher percentage for women.

Figure no. 6. Distribution of the studied group on age, sex and blood pressure values

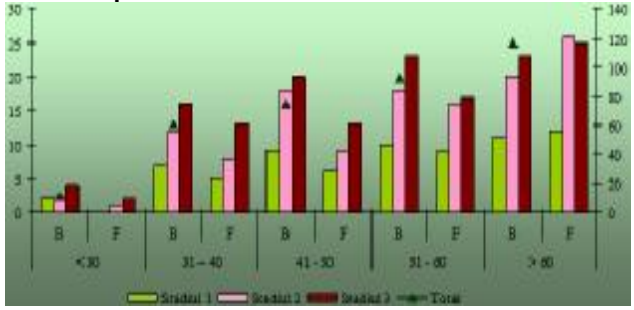


Figure no. 7. Distribution of patients by area of residence

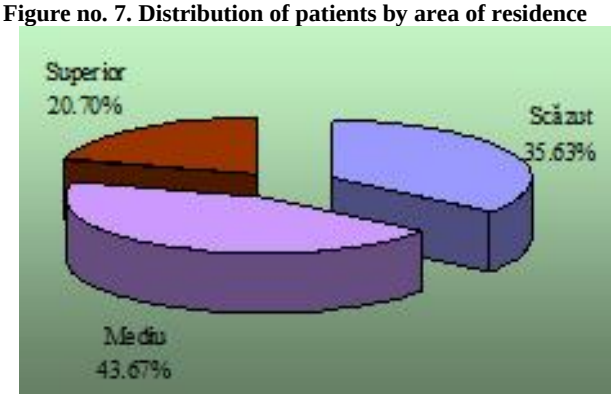
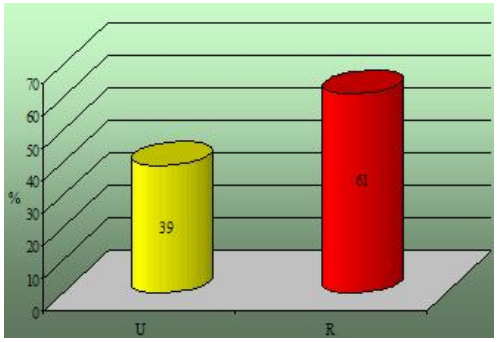


Figure no. 8. Distribution of the studied group depending on the level of education



Starting from the double valence hypertension has, a disease in itself and a risk factor for cardiovascular disease, it was considered necessary to establish the cardiovascular risk for the studied hypertensive patients by using the "cardiovascular risk stratification into four categories" (5) taken from the Guidelines for hypertension management, 2007.

The approach has focused on three areas:

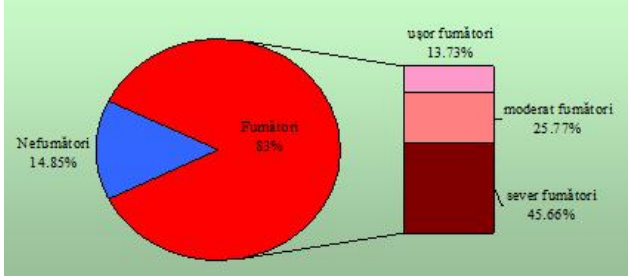
- Analysis of risk factors;
- Identification of target organs to achieve (type and prevalence of complications);
- Presence of comorbidities.

Analysis of the risk factors in the patients enrolled in the study

The aimed risk factors were: smoking, dyslipidemia, increased fasting blood glucose, obesity, family history of premature cardiovascular disease (B <55 years, F <65 years), salt and alcohol consumption.

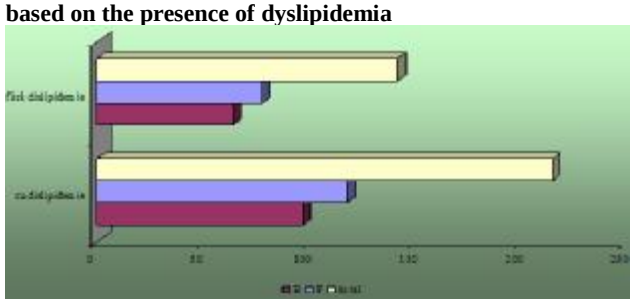
Assessment of smoking history: patients were assessed for history of smoking, being included in one of the following categories: non smokers, smokers, smokers with easy subcategories 1-13 packs / year, moderate smoking 14-50 packs / year, severe smoking> 50 packs / year. The estimation of the number of packs/year was made after the formula: number of cigarettes smoked per day x number of years of smoking/20.

Figure no. 9. Assessment of smoking history



The presence of dyslipidemia: LDL cholesterol> 115 mg / dl, HDL cholesterol <40 mg / dl in men and <50 mg / dl in women, triglycerides> 150 mg / dl;

Figure no. 10. Distribution of the hypertensive patients based on the presence of dyslipidemia



Between the patients with and without dyslipidemia, there are significant differences p = 0.03043 <0.05 t test.

Obesity was defined as the presence of a BMI over 30 kg/m^2, abdominal obesity was estimated by measuring the waist circumference (over 102 cm for men and above 88 for women) (6), global obesity is, as we have also found during the study, an additional cardiovascular risk factor, with a significant less influence.

Increased blood glucose a jeun – values of glycaemia ranging between 110mg/dl and 126 mg/dl resulted after two measurements on different days.

Figure no. 11. Structure of the studied group according to the presence of obesity

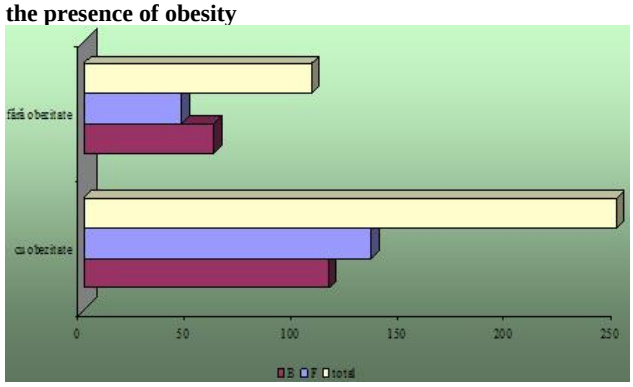
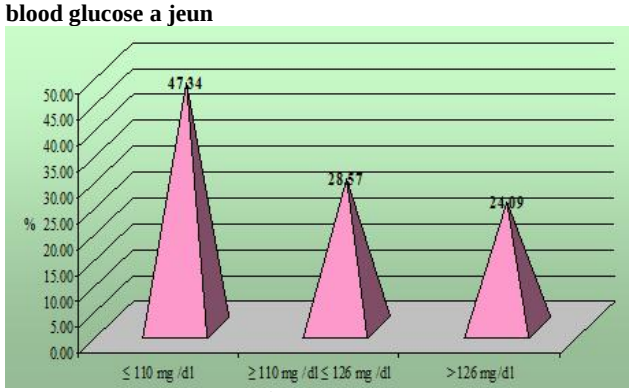


Figure no. 12. Distribution of the patients with increased blood glucose a jeun

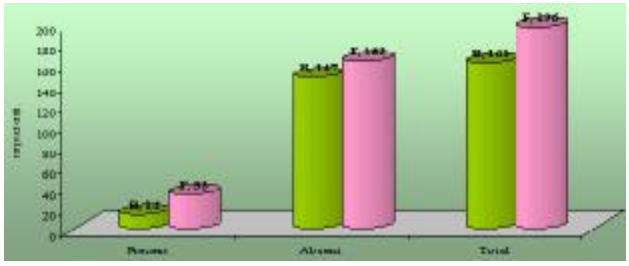


Family history of premature cardiovascular disease – the patients were asked about their family history of cardiovascular disease under 55 years for men and under 65 for women.

Salt and alcohol consumption history – during anamnesis, the patients were asked about their eating habits of excessive salt and alcohol consumption; the analysis of the data

obtained revealed the following situation.(figure no. 14)

Figure no. 13. Family history of premature cardiovascular disease



Presence of the metabolic syndrome in the studied patients - we used the NCEP-ATP III criteria (National Cholesterol Education Program - Adult Treatment Panel III).(7)

Figure no. 14. Consumption of salt and alcohol

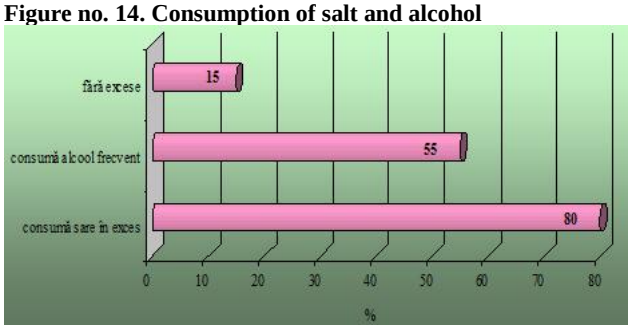


Figure no. 15. Associated risk factors

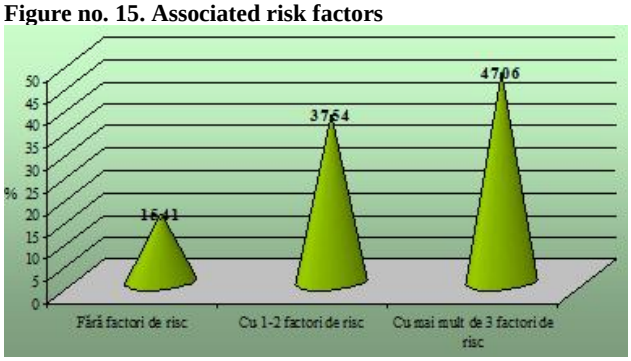
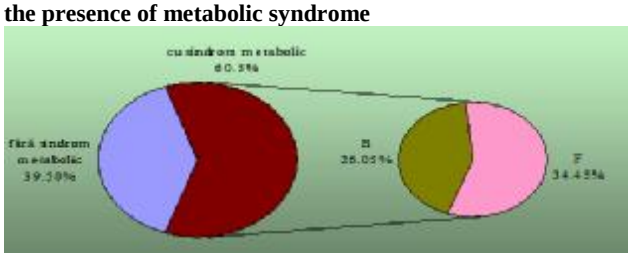


Figure no. 16. Structure of the studied group according to the presence of metabolic syndrome



The demographic characterization in terms of the risk factors in the studied group creates the prerequisites for a scientific analysis and offers the possibility of applying the operational plan of the study with a view to achieve the strategic objectives.

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