

Bukovinian State Medical University

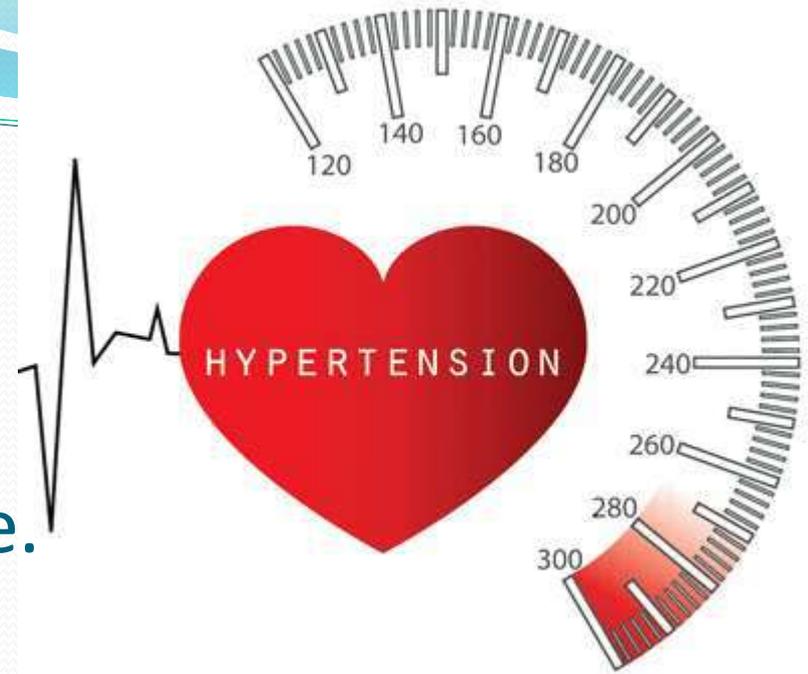
**PHENOTYPIC MANIFESTATIONS OF  
ESSENTIAL ARTERIAL HYPERTENSION  
DEPENDING ON THE VITAMIN D  
RECEPTOR GENE POLYMORPHISM  
VDR (rs2228570)**

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## *Actuality.*

Essential (primary) arterial hypertension (EAH) remains the most common non-infectious disease worldwide.

The overall prevalence of hypertension in adults is about 30-45% with a standardized prevalence in the world of 24% and 20% in men and women, respectively. The EAH prevalence exceeds 60% after the age of sixty. The number of hypertensive patients continue to grow, predicting as much as 1.5 billion individuals in 2025.



Hypertension is a multifactorial disease with the interaction of many risk factors, environmental and strong genetic background. The most studied genetic factors are those involved into the Renin-angiotensin-aldosterone system activity (RAAS), like angiotensinogen gene (AGT),

angiotensin-converting enzyme (ACE), angiotensin II receptor gene (AGTRII), as well as modified factors such as obesity, increased body mass index (BMI), excessive salt intake, alcohol consumption, stress and low levels of high density lipids and total cholesterol increase.



Genes determine approximately 20-60% of blood pressure (BP) variability and some peculiarities of hypertensive-mediated organs damage in different populations. Some pathogenic genes have already been studied, but there are a number of others whose effects need further study.

So, *the aim of the study* was to analyze the phenotypic manifestations of EAH depending on the vitamin D receptor gene polymorphism (VDR, rs2228570).

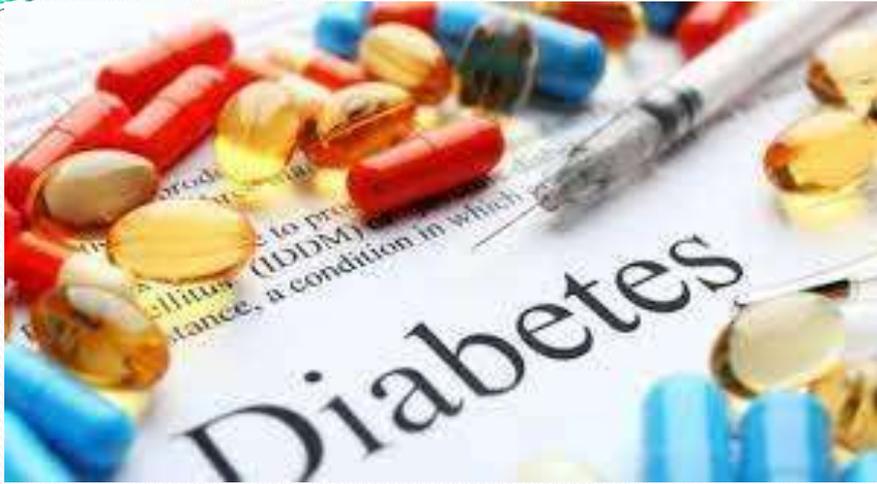
## Materials and methods.

The study involved 100 patients suffering from EH with target-organ damaging, moderate, high or very high cardiovascular risk.

	Men, n	Women, n
Control group, n=60	22 (38%)	38 (62%)
Patients with EAH, n=100	21 (21%)	79 (79%)

The average age was  $59.87 \pm 8.02$  yo. The control group involved 60 practically healthy persons, matched by age and gender. All enrolled / screened patients signed the Informed Consent to participate in the research. The VDR (rs2228570) gene polymorphism was studied with PCR based method.

## Results.

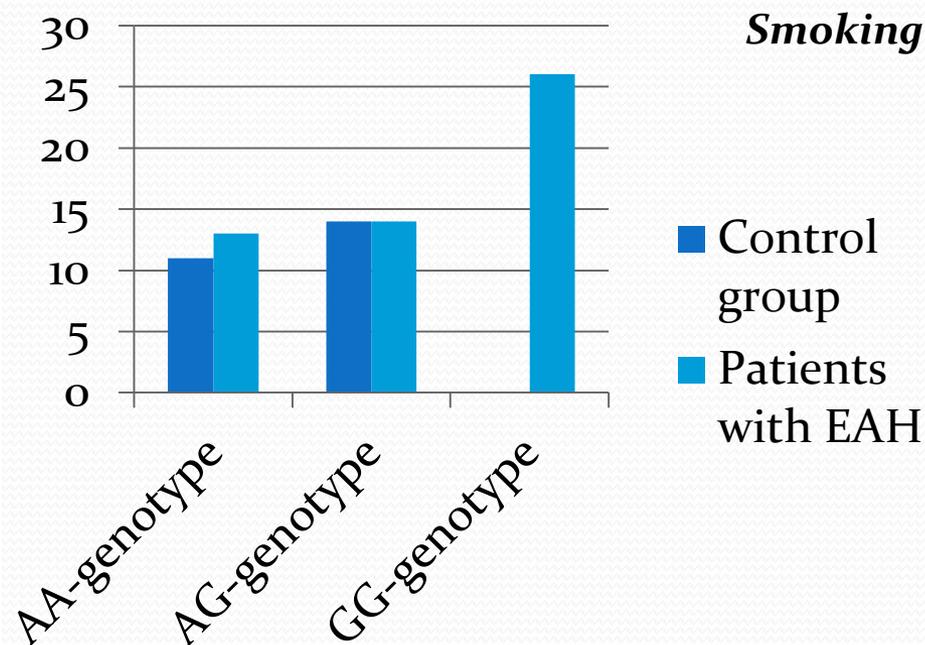


Obesity of 1-3 degrees was observed in 53% of patients with EAH: among EAH 1st. - 21%, among the EAH 2-3 st. - 25%. In the control group 16% of patients suffered from obesity.

44.4% of patients with elevated normal BP and 34% of patients with EAH 2-3 st. had diabetes mellitus (DM) type 2, while only 19% of patients with EAH 1 st. had DM.



VDR genotypes distribution taking into account the presence of DM showed that DM was present in 35% of patients with AA-genotype, which is 1.6 times more often than among patients with GG-genotype (22%). Most smokers were among patients with GG-genotype (26%), which is twice as common as among patients with AA- and AG-genotype (13% and 14%, respectively).



74% of GG-genotype carriers with EAH had obesity 1-3 degrees while only 14% of GG-genotype carriers had obesity in control group. 80% of female patients with AA-genotype had increased **waist-hip ratio (WHR)** while all women in the control group had normal values. 76% of AG-genotype carriers and 81% of GG-genotype carriers had 2.3 and 2.8 times increased WHR, respectively, compared with the control group.

Deviations of systolic and diastolic BP depending on the VDR gene polymorphic variants were not found.

### **Conclusions.**

AA-genotype is associated with a higher frequency of DM type 2, with increased WHR in women; GG-genotype is associated with elevated BMI, especially in men.

