

THE INCIDENCE OF ARTERIAL HYPERTENSION AND ASYMPTOMATIC URINARY ANOMALIES IN YOUNG ADULTS

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REZUMAT

Introducere: Hipertensiunea arterială (HTA) este o afecțiune cu o incidență crescută în populația generală. Incidența HTA esențială crește cu vârsta. Depistarea HTA în stadii incipiente este importantă pentru inițierea precoce a terapiei. Decelarea anomaliilor urinare asimptomatice prezintă importanță pentru incadrarea etiologică și instituirea terapiei precoce. **Material și metodă:** Am luat în studiu un lot de 795 studenți din anul V de la Facultatea de Medicină, cărora le-am măsurat TA la începutul stagiului de nefrologie și după 2 ore de stagiu. De asemenea am efectuat un sumar de urină din urina spontană. **Rezultate:** Incidența HTA a fost de 4%. La un număr de 30 studenți am decelat HTA (TA \geq 140/90 mm Hg) după cum urmează: HTA sistolică + diastolică la 47%, HTA sistolică la 36%, HTA diastolică la 17%. Evoluția HTA a fost următoarea: la 26% dintre studenții cu HTA TA a rămas nemodificată, la 39% TA sistolică și diastolică a scăzut, la 4% TA sistolică a scăzut iar TA diastolică a crescut, la 18% TA sistolică a rămas nemodificată, iar TA diastolică a scăzut, iar la 14% TA sistolică a rămas nemodificată, iar TA diastolică a crescut. Anomaliile urinare am decelat la 25% din studenți. La studenții cu TA normală am decelat următoarele anomalii urinare: hematurie + proteinurie la 4% din studenți, proteinurie la 38%, microhematurie la 4%. La studenții cu TA normală am decelat următoarele anomalii urinare: hematurie + proteinurie la 11% din studenți, proteinurie la 54%, iar microhematurie la 37%. **Concluzii:** Depistarea HTA asimptomatice precum și a anomaliilor urinare au importanță practică în tratamentul precoce al acestora pentru prevenirea visceralizării și complicațiilor HTA.

Cuvinte cheie: HTA la tineri, anomalii urinare

ABSTRACT

Introduction: The arterial hypertension (AHT) has an increased incidence in the general population. Essential AHT incidence increases with age. Detecting AHT in early stages is important for the precocious initiation of the therapy. The asymptomatic urinary anomalies are of a great importance for etiological framing and the initiation of precocious therapy. **Material and method:** We have studied a group of 795 students in the 5th year of study from the Faculty of Medicine, and measured the BP at the beginning of the nephrology stage and after 2h of probation. We have also carried out a spontaneous urine exam. **Results:** The incidence of AHT was of 4%. In 30 students we have demonstrated AHT (BP \geq 140/90mm Hg) as follows: systolic + diastolic AHT in 47% students, systolic AHT in 36% students, diastolic AHT in 17% students. The evolution of AHT was as follows: at 26% of the students BP remained unmodified, in 39% students systolic and diastolic BP decreased, in 4% systolic BP decreased and diastolic BP raised, in 18% of the students systolic BP remained unmodified and diastolic BP decreased and in 14% systolic BP remained unmodified and diastolic BP raised. We have revealed urinary anomalies in 25% of the students. In the students with normal BP, we have revealed the following urinary anomalies: hematuria + proteinuria in 4% of the students, proteinuria in 38% of the students, microhematuria in 4% of the students. In students with normal BP, we have revealed the following urinary anomalies: microhematuria + proteinuria in 11% of the students, proteinuria in 54% and microhematuria in 37%. **Conclusion:** Detecting asymptomatic AHT as well as urinary anomalies has a practical importance in precocious initiation of treatment thus preventing visceralization and AHT complications.

Key Words: AHT in young adults, urinary anomalies

INTRODUCTION

Arterial hypertension (AHT) represents an important problem in clinical pathology. It is one of the most

widespread cardiovascular diseases. The prevention of arterial hypertension as well as of its complications represents a priority for the general practitioner. The diagnosis of AHT in the initial stages, before the occurrence of visceralization is extremely important.¹⁻⁵

The incidence of AHT in the general population is variable. If in children and teenagers an increased incidence of secondary AHT prevails, in youngsters and young adults the incidence of essential AHT grows.^{6,7} The incidence of essential AHT dramatically increases with age. Thus, we estimate that AHT incidence in the adult population over 60 years old is over 50%, while in the young adults before 40 years the incidence

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of AHT is over 20%. Worldwide, we grant a special attention to the onset of AHT installation. Even low variations in arterial blood pressure have pronounced effects on the cardiovascular disease. It is estimated that a 2 mmHg decrease of systolic BP reduces the rate of coronary disease by 4%.

The urinary anomalies represented by proteinuria and hematuria are also frequently encountered in clinical practice. They can signal important alterations of the urinary system.⁸ Their diagnosis, alone or in association, imposes supplementary investigations in order to establish their etiology.⁹ Their association to AHT draws attention to renal hypertension.

Their timely diagnosis in the initial stages is important in order to establish the therapy directed at causative factors.^{10,11}

AIM OF THE STUDY

The purpose of this work is to investigate the incidence of AHT and of asymptomatic urinary anomalies in young adults.

MATERIALS AND METHODS

We have studied a group of 795 students from the 5th year of the Victor Babes University of Medicine and Pharmacy, Timisoara.

Measurements of BP were performed at the beginning of the Nephrology clinical rotation and after 2 hours of probation. Urinalysis using dipsticks has also been carried out. The mean age was 23.47 +/- 3.23 years old. 531 subjects were female and 264 male.

We have included in this study the students of the Faculty of Medicine, after obtaining their consent, in order to avoid the stress of "white gown" when determining BP.

RESULTS

In 765 (96%) students at the beginning of the probation, we have found normal BP values of up to 135 mmHg for systolic tension and values of up to 85 mmHg for diastolic BP.

BP values $\geq 140 / 90$ mm Hg have been found in a number of 30 (4 %) students.

In a number of 14 (47 %) students, we have found elevated systolic and diastolic BP as well. To them, the average value of BP was of 145.7 +/- 8.28 mm Hg for systolic BP and of 91.78 +/- 5.4mm Hg for diastolic BP.

In a number of 11 (36%) students, we have only found increased values of systolic BP. Average BP in

these patients was 143.63 +/-8.96mm Hg for systolic BP and of 78.18 +/- 6 mm Hg for diastolic BP. In a number of 5 (17%) students increased diastolic BP was the only finding, and they had a mean BP of 131 +/- 2.23 mm Hg for systolic BP and of 92 +/- 4.47 mm Hg for diastolic BP.

After 2 hours of probation, in the 30 students with initial raised values of BP $\geq 140/90$ mm Hg we have found the following: in the 14 students with AHT, systolic and diastolic BP decreased from a mean value of 146/91 mm Hg to a mean value of 139/87 mm Hg ($p < 0.4$); in 11 students with systolic AHT, BP decreased from a mean value of 144/78 mm Hg to 119/77 mm Hg ($p < 0.5$), and in the students with diastolic AHT the average value of BP decreased from 131/92 mm Hg to 126/82 mm Hg ($p < 0.5$);

- In 4 (13%) students, the systolic and diastolic BP remained unchanged (3 students with systolic and diastolic AHT and 1 student with systolic AHT);

- In 2 (7%) students the systolic values of BP decreased and the diastolic values BP increased (from 90mmHg to 110 and 95 mm Hg respectively);

- In 18 (60%) students the systolic and diastolic BP values decreased (in 8 students with systolic and diastolic AHT – at 7 students at normal values and at 1 student remaining at raised values – 100 mm Hg ; in 8 students with systolic AHT– reaching in all of them normal values; in 2 students with diastolic AHT– from 90 to 80 mm Hg);

- In 4 (13%) students the systolic BP values remained unchanged and the diastolic BP values decreased (in 1 student without reaching normal values and in 3 students reaching normal values;

- In 2 (7%) students the systolic BP values remained unchanged and the diastolic BP values increased (in 1 student at normal values, and in 1 student at 95mmHg).

In the urinary exam, we found the following:

- In 595 (75%) students, there were no pathological elements.

- In 200 (25%) students, we have found pathological elements in the urine.

- 20 (11%) students with initial normal BP values, showed microhematuria and proteinuria;

- 60 (31 %) students with initial normal BP values, showed microhematuria;

- 107 (58 %) students with initial normal BP values, had microproteinuria;

- 1 (3%) student with initial increased BP, showed microhematuria and proteinuria;

- In 11(37 %) students with initial increased BP values we have found proteinuria;

- 1(3%) student with initial increased BP values has revealed microhematuria;
- In 17 (57%) students with increased BP values we have not found any urinary anomalies.

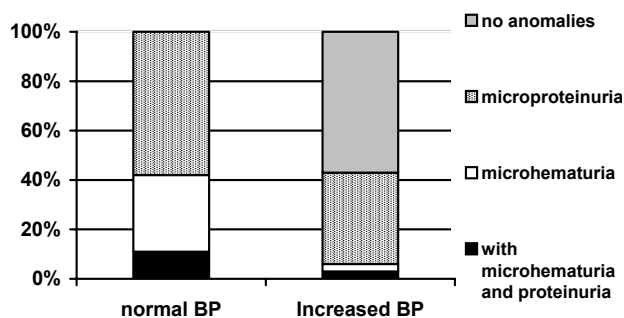


Figure 1. Urine exam findings in the two groups.

DISCUSSION

Arterial hypertension represents a public health problem extremely important due to its high frequency and to the complications it can generate as well. This is the reason why there are many international organizations dealing with monitoring and standardizing AHT.¹²

As AHT is characterized through spontaneous variations the diagnosis of AHT will be based on more measurements carried out in various conditions paying attention to remove any factor to the apparatus, patient or physician.¹³

At the Faculty of Medicine, where the students are admitted on the grounds of the medical certificate we might expect that the incidence of AHT is low.

According to the recommendations of the 6th Report of Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure of 1997, depending on the values of arterial pressure tracked down at a first medical examination, the medical attitude will be differentiated.

We have used as reference the AHT classification ESH – ESC from 2003 and JNC VII from 2003.

We have considered in our study the BP value ≥ 140 mm Hg as AHT for systolic TA and the BP value ≥ 90 mm Hg for diastolic TA.

The incidence of AHT in the studied group of students was 4%.

Data from the literature shows a similar incidence of AHT in young adults. According to Gan in a study performed in Singapore on 3352 young soldiers, the incidence of AHT was of 3.5%.¹⁴

The raised incidence of AHT in young adults might partially be because of the fact that the students' addressability at the medical offices is low.

Another explanation might be the absence of clinical symptomatology. The students in the 5th year of the Faculty of Medicine know the symptomatology of AHT, which would mean that in the presence of suggestive symptomatology they would go to the doctor.

In the studied group, we have found an incidence of systolic and diastolic AHT of 47%. The incidence of diastolic AHT was of 17% and of systolic AHT of 36%.

In young people, the greatest incidence of AHT is represented by cardiac congenital malformations (aorta coarctation), and the diagnosis of AHT is known in this situation by the patient since childhood and treated. Another cause of AHT in young adults is endocrine diseases. Type I Diabetes Mellitus secondary AHT occurs in young adults known to be diabetic. AHT of renal cause can be due to reflux nephropathy, to a stenosis of renal artery through vascular malformation (of the renal artery), or to chronic glomerulonephritis (chronicization of acute poststreptococcal glomerulonephritis).

AHT secondary to AGN has an abrupt onset due to the acute nephritic syndrome with consecutive edema.

Essential AHT in young adults is rare. It first appears to patients with heredo-collateral hypertensive history.

Smoking can contribute to the raise of arterial pressure.¹⁵ Cocaine and amphetamines can also cause AHT in young people. The use of steroids by sportsmen in order to reach performances can also determine AHT.

AHT in young people is associated to risk factors and have hypertensive heredo-collateral history (parents, grandparents).¹⁶⁻¹⁸ In young adults, the body weight and the raise of the body weight is correlated to arterial BP.^{7,10} The modification of the diet and physical exercise leads to the decrease of the cardiovascular risk. The decrease of body weight in obese young adults is accompanied by the significant decrease of BP.¹

The association of the caloric restriction with physical exercise led to the decrease and vascular structural modifications.^{19,20}

Clinical data shows that a cardiovascular response to stress, includes the raise of BP.¹²

In the study undertaken by us we have revealed the presence of systolic and diastolic AHT in 47% students. The stress is accompanied by the raise of BP values. These students will be measured again in peaceful conditions without stress. The physical exercise is accompanied by the decrease of BP values.²¹

Diastolic AHT is more frequently present in young

people. We have revealed an incidence of diastolic AHT in 17% of the students.

Systolic AHT is frequent in old patients, over 60 years old. In the study undertaken by us, the incidence of systolic AHT was of 36%.

The revealing of essential AHT or of renal causes of AHT in incipient stages is extremely important in order to prevent visceralization and complications of AHT.

After the 2 hours of probation, we have found a differentiated evolution of AHT. Thus, at a number of 4 (13%) students the systolic BP as well as diastolic values remained unmodified.

The evaluation of a hypertensive patients will have as purpose the confirmation of this diagnosis, the establishment of the seriousness of AHT, the identification of the risk factors of cardiovascular disease, the assessment of the affection on target organs as well as the associated conditions influencing the prognosis or treatment.

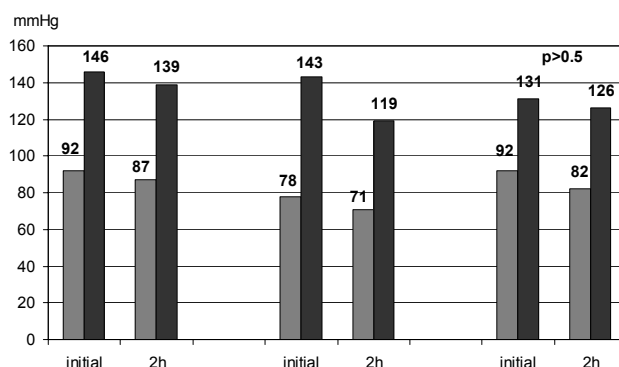


Figure 2. Evolution of AHT.

In the study undertaken by us, we have also carried out a spontaneous urine stick test and have revealed urinary modifications in a number of 200 (25%) students. Thus, we have revealed proteinuria in 118 students, and microhematuria in 61 students. 21 students presented both microhematuria and proteinuria.

Proteinuria revealed in those without symptoms also imposes an evaluation through a rigorous anamnesis, a clinical complete examination, as well as carrying out laboratory and paraclinical examinations.

Proteinuria may be also presented in healthy persons after a physical effort or extended orthostatism but it disappears in repose to resting or when changing body position. In these situations, proteinuria is due to hemodynamic modifications.²²

Intermittent proteinuria frequently accompanies the febrile syndrome, and disappears with the decrease of fever.

They have noticed intermittent proteinuria independent to the patient's position. It is present in 50% of casually gathered urine samples. Such cases are recommended for follow-up, detecting proteinuria through annual analyses on a 5 years period.

Some persons constantly present proteinuria, persisting in all gathered samples of urine.

Proteinuria in pathological conditions imposes the quantitative dosing on 24 h and the establishment of glomerular or tubular etiology.

Proteinuria revealing through dipsticks is an alarm sign and imposes the continuation of the investigations.

The association of proteinuria to microhematuria imposes the exploration of the renal system in order to reveal chronic glomerulonephritis.

Out of the 30 students with AHT only 13 presented urinary anomalies. Proteinuria was present in 11 patients.

The association of AHT with proteinuria imposes complex supplementary investigation in order to frame and establish the subsequent therapeutic behavior.

Proteinuria, constant symptom of glomerular nephropathies is also of value to the prognosis and evolution. Microalbuminuria reflects an endothelial dysfunction both glomerular and in the systemic circulation.

In diabetic nephropathy, proteinuria is a predictive factor of the evolution.

Proteinuria was considered a predictive factor of AHT evolution as well as of the appreciation of cardiovascular injuries.

Hematuria is another element met in practical work. Hematuria may appear in pathological conditions in patients with renal tuberculosis, renal lithiasis, renal tumors, glomerulonephritis, and hematology.

Microhematuria revealed in 62 students in the study also imposes the investigation in order to elucidate its etiology.

The study undertaken by us attracts the attention on the important incidence of asymptomatic AHT and of symptomatic urinary anomalies among young people.

A major importance must be granted to the revealing of urinary asymptomatic anomalies. Their presence attracts the attention on an important health problem. Revealing a glomerular chronic nephropathy in the initial stage is of a special importance especially for a precocious therapy. The correct treatment of glomerular nephropathies and the proteinuria reduction is important in order to slow down the progression of the chronic renal disease.

Their finding imposes a subsequent strategy in order to track down the early stages of diseases with impact on the general health status of the population. A cross-sectional study has been preferred because there was a reduced compliance of the included persons.

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