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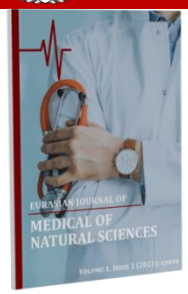

STRUCTURAL AND FUNCTIONAL STATE OF THE KIDNEYS AND HEART IN THE DEVELOPMENT OF RENAL DYSFUNCTION IN PATIENTS WITH ARTERIAL HYPERTENSION

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https://doi.org/10.5281/zenodo.15854594

ARTICLE INFO

Received: 02nd July 2025
Accepted: 09th July 2025
Online: 10th July 2025

KEYWORDS

Arterial hypertension, renal dysfunction, glomerular filtration rate.

ABSTRACT

Arterial hypertension negatively affects a number of systems in the human body, and can cause significant damage, especially to important vital organs such as the kidneys and heart. Arterial hypertension usually affects all organs in the body through high blood pressure, but the kidneys are one of the most sensitive organs to high pressure. This condition leads to functional and structural changes in the kidneys and heart due to the long duration of hypertension and the lack of timely application of countermeasures.[2,4]

СТРУКТУРНО-ФУНКЦИОНАЛЬНОЕ СОСТОЯНИЕ ПОЧЕК И СЕРДЦА ПРИ РАЗВИТИИ ПОЧЕЧНОЙ ДИСФУНКЦИИ У ПАЦИЕНТОВ С АРТЕРИАЛЬНОЙ ГИПЕРТЕНЗИЕЙ

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https://doi.org/10.5281/zenodo.15854594

ARTICLE INFO

Received: 02nd July 2025
Accepted: 09th July 2025
Online: 10th July 2025

KEYWORDS

Артериальная гипертензия, дисфункция почек, скорость клубочковой фильтрации.

ABSTRACT

Артериальная гипертензия негативно влияет на ряд систем организма человека и может нанести значительный ущерб, особенно таким важным жизненно важным органам, как почки и сердце. Артериальная гипертензия обычно поражает все органы в организме через высокое кровяное давление, но почки являются одним из наиболее чувствительных органов к высокому давлению. Это состояние приводит к функциональным и структурным изменениям в почках и сердце из-за длительной гипертонии и отсутствия своевременного применения контрмер.

ARTERIAL GIPERTENZIYALI BEMORLARDA BUYRAKLAR DISFUNKSIYASI RIVOJLANISHIDA BUYRAKLARNING VA YURAKNING STRUKTUR-FUNKSIONAL HOLATI

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https://doi.org/10.5281/zenodo.15854594

ARTICLE INFO

Received: 02nd July 2025
Accepted: 09th July 2025

ABSTRACT

EURASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES
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Online: 10th July 2025
KEYWORDS
Arterial gipertenziya, buyraklar dinfunksiyasi, koptokchalar filtratsiya tezligi.

Arterial gipertenziya inson organizmidagi bir qator tizimlarga salbiy ta'sir ko'rsatadi, va ayniqsa buyraklar va yurak kabi muhim hayotiy organlarga sezilarli darajada zarar yetkazishi mumkin. Arterial gipertenziya, odatda, qon tomirlarining yuqori bosimi orqali organizmdagi barcha organlarga ta'sir qiladi, ammo buyraklar yuqori bosimga eng sezgir organlardan biridir. Bu holat gipertenziyaning uzoq davomiyligi va unga qarshi choralarning o'z vaqtida qo'llanilmasligi tufayli buyraklar hamda yurakning funktsional va struktural o'zgarishlariga olib keladi.

Arterial hypertension is a disease characterized by persistently high blood pressure in the arteries. In Western countries, approximately 30-45% of the population suffers from high blood pressure. However, in Uzbekistan, this number is difficult to calculate accurately, but national studies have shown that it may be about 25-30% among adults. According to statistics, kidney dysfunction affects millions of people worldwide. Approximately 700,000 people suffer from chronic kidney disease every year. Women are more likely to suffer from this disease than men.

The kidneys play an important role in performing their main functions, namely, removing toxins from the body, maintaining fluid balance and ensuring the correct distribution of electrolytes. Therefore, the effect of arterial hypertension on the kidneys can lead to the development of renal failure and kidney diseases. [1,3]

Purpose of the study: To study the effect of arterial hypertension on the development of renal dysfunction.

Materials and methods: Our research is based on the results of laboratory and instrumental examinations of 80 patients with renal dysfunction and 30 healthy control groups. A group of patients with and without arterial hypertension, with renal dysfunction, was included in the study. All patients included in the study underwent laboratory and instrumental examinations. 80 patients included in the study were divided into 2 main groups on the basis of a "case-control" design.

1 – group. No arterial hypertension, group with advanced renal dysfunction (n=40). Male n=10 (25%), female n=21 (75%), average age -35.5

Group 2 – group. Group with arterial hypertension, group with advanced renal dysfunction (n=40). Male n=15 (37.5%), female n=25 (62.5%), average age -47.2

All patients with advanced renal dysfunction, with and without arterial hypertension who were included in the study underwent instrumental examinations such as glomerular filtration rate(GFR), renal vascular dopplerography (RVD), and echocardiography (ExoKG).

Results and their analysis: The functional state of the kidneys was studied by GFR, renal vascular dopplerography and the functional state of the heart was studied by echocardiography (ExoKG) among the patients in groups 1 and 2. In the groups studied, renal hemodynamics and GFR were evaluated. Accordingly, when comparing groups 1 and 2, a decrease in GFR was observed in patients in group 2, a significant decrease in the functional state of the kidneys was observed, respectively 90.14±3.17- 46.9±72.55. In the renal vascular doppler examination, the initial systolic velocity (Vmax), final diastolic velocity (Vmin), resistance index, i.e. vascular

resistance (RI), pulse index (PI) and systolic-diastolic index (S/D) of interstitial blood flow were studied. Accordingly, when comparing groups 1 and 2, it was observed that renal blood flow was significantly reduced in patients in group 2. RI 0.63±0.01-0.75±0.01* PI, RI 1.59±0.02-1.70±0.01* PI was positively correlated (r=0.28). End-diastolic velocity, pulse index and systolic-diastolic index were significantly negatively correlated (r=-0.45, r=-0.27). Renal vascular resistance index (RI) and pulse index (PI) were significantly positively correlated with left ventricular end-diastolic volume (LVEDV) and left ventricular end-diastolic diameter (LVEDD) (r=0.25, r=0.33- r=0.25, r=0.32). Table 1.

Table 1

Renal vascular dopplerography	1-group	2-group
Age	35,5±0,83	47,2±2,85
Vmax	0,85±0.02	0,79±0.02*
Vmin	0,26±0.01	0,24±0.03
RI	0,63±0.01	0,75±0.01*
PI	1,59±0.02	1,70±0.01*
S/D	3,52±0.06	3,85±0.06*

***Statistically significant (p<0.05)**

Thus, an increase in renal vascular resistance leads to the development of renal dysfunction. The structural and functional state of the heart was examined in the studied groups. When comparing groups 1 and 2, left ventricular systolic dysfunction was observed, that is, the left ventricular end-diastolic volume and end-systolic volume significantly differed in group 2 compared to group 1, respectively 109.04±4.44 -139.13±6.60*. At the same time, the left ventricular end-diastolic size and end-systolic size and the ejection fraction (EF) were also significantly different in group 2 compared to group 1, respectively 3.13±0.07-3.63±0.11*, 4.80±0.08-5.31±0.11*, 59.25±1.17-54.03±1.14*. The increase in heart size and dimensions, namely left ventricular end-diastolic size, left ventricular end-systolic size, formed a significant positive correlation with ventricular interventricular wall thickness, left ventricular myocardial mass and ventricular myocardial mass, respectively (r=0.36, r=0.34), (r=0.71, r=0.68), (r=0.61, r=0.57). Left ventricular end-diastolic size was positively correlated with left ventricular end-systolic diameter (LVESD). However, left ventricular volume and size were significantly negatively correlated with ejection fraction, respectively (r=-0.39, r=-0.70), (r=0.37, r=0.69). The development of arterial hypertension increases the volume, size, and myocardial mass of the heart, which causes cardiac remodeling and the development of cardiorenal syndrome. Enlargement of the heart chambers and a decrease in ejection fraction lead to stagnation of blood in the kidneys and the development of renal dysfunction. Left ventricular end-diastolic volume, left ventricular end-systolic volume and left ventricular end-diastolic volume, left ventricular end-systolic volume formed a significant negative correlation with glomerular filtration rate, respectively (r=-0.37, r=-0.36), (r=-0.36, r=-0.34). An increase in cardiac output decreases glomerular filtration rate in the kidney, which leads to the development of renal dysfunction Table 2.

Table 2

EXOKG results	1-group	2-group
Age	35,5±0,83	47,2±2,85
LV EDD	109,04±4,44	139,13±6,60*
LV ESD	39,03±2,27	56,53±3,78*
LV EDV	4,80±0,08	5,31±0,11*
LV ESV	3,13±0,07	3,63±0,11*
LVM	220,05±15,22	245,98±13,92
Ind.mass	160,95±12,56	177,05±10,67
SV	70,00±3,20	79,89±3,80*
EF	59,25±1,17	54,03±1,14*

***Statistically significant (p<0.05)**

Conclusion: According to the results of the scientific research, taking into account the proportional damage to the kidneys and heart in patients with arterial hypertension with advanced renal dysfunction, that is, the pathogenetic mechanisms of cardiorenal syndrome, timely examination of hemodynamic disorders in the heart, as well as renal vascular dopplerography and EXOKG examinations, allows for early assessment of early changes in renal dysfunction in patients, thereby helping to prevent further exacerbation of the existing disease in patients.

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