MODERN MEDICINE AND PRACTICE
https://www.innovatus.es/index.php/ejmmp
EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE
Vol. 2 No. 3 (2022) EJMMP ISSN: 2795-921X

ASSESSMENT OF RENAL VASCULAR BLOOD FLOW IN PATIENTS WITH ARTERIAL HYPERTENSION BY ULTRASOUND DOPPLEROGRAPHY

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Annotation: *Ultrasound examination of the kidneys by the method of Doppler ultrasonography of the renal arteries is necessary for patients with high blood pressure in order to detect arterial hypertension. Purpose of the study. To study the state of the kidneys and renal blood flow in patients with arterial hypertension. 50 patients with arterial hypertension were examined. The criteria for the diagnosis of arterial hypertension were considered pressure 140/90 mm Hg. Art. and more. Conclusions. An early echographic criterion of kidney damage in patients with arterial hypertension is an increase in linear blood flow and intra-renal vascular resistance in combination with an increased glomerular filtration rate.*

Keywords: *arterial hypertension, kidney, renal blood flow, Dopplerultrasonography.*

Relevance of the study. Currently, with the increase in the incidence of arterial hypertension, the search for algorithms for diagnostic methods of examination is expanding, and this problem still remains relevant. One of the methods of studying the circulatory organs and in particular renal circulation is Dopplerography. This relatively new method has not yet found a worthy place in urological medical institutions, only in recent years it has taken a strong position in cardiology, obstetrics and gynecology, vascular surgery and transplantology [1,2].

Ultrasound Dopplerography is an important addition to ultrasound examination of the kidneys. With the help of ultrasound Dopplerography, it is possible to detect renal artery stenosis, as a result of which doctors no longer need to resort to a streamlined diagnosis of "vascular atrophy of the kidney". Dopplerography can detect pathological conditions even before they lead to structural tissue changes.

The characteristics of this method, namely its accuracy (92%), sensitivity and specificity (100%) make it possible to use it as the main non-invasive method for diagnosing and monitoring rejection of a transplanted kidney, occlusion of renal graft vessels, and make it possible to refuse angiographic examination to confirm the diagnosis [7]. To properly assess the functional state of the kidneys, it is necessary to have data on the state of renal circulation [8]. Dopplerography provides unique information about the vascular architectonics and circulatory features of the kidney affected by any pathological process, as well as in the contralateral kidney, which will have to ensure the vital activity of the body in the case of nephroectomy. Dopplerography can noninvasively assess renal perfusion, establish the degree of preservation of blood flow to ensure the functioning of the renal parenchyma by directly measuring the blood flow rate and the amount of resistance in the renal vessels [3].

Dopplerography provides additional information to the information obtained during ultrasound examination, allows for more accurate selection of patients for referral to specialized inpatient departments. Dopplerography makes it possible to make a differential diagnosis between vasorenal neurogenic arterial

hypertension and parenchymal form of neurogenic hypertension. The issues related to the timely detection of the severe course of arterial hypertension syndrome in renal patients, determining the prognosis of the disease, are relevant, because determines the management tactics of patients and can help reduce the risk of cardiovascular and renal complications. In this regard, it seems appropriate to study the state of the kidneys and vascular blood flow in patients with arterial hypertension using Dopplerography.

The improvement of methodological approaches and medical diagnostic systems has led in recent years to significant success in solving one of the main problems of modern cardiology and angiosurgery - differential diagnosis of arterial hypertension. [5,6,10].

The importance of information about the hemodynamic parameters of the kidney is obvious if we consider that 20% of the blood ejected by the heart flows through the kidneys, whose mass is approximately 0.5% of the body weight, and the renal blood flow is 400 ml per 100 g of tissue per minute (Breneretall). To properly assess the functional state of the kidneys, it is necessary to have data on the state of renal circulation [4].

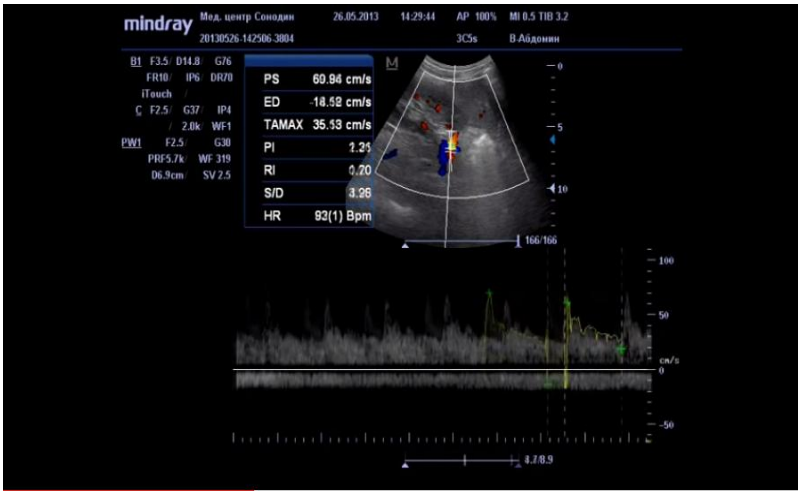
The first successful attempt to use the Doppler method in the study of blood flow was made by S. Satamura [12]. In 2010, the ultrasound device described in [9] made it possible to indirectly determine the state of blood flow in the arteries and veins by recording the noise that occurs when blood passes through the vessel. The first report on the practical application of the Doppler echographic Flow meter to assess blood flow in the kidneys belongs to [11].

Material and methods of research. 70 patients with arterial hypertension were examined. There were 46 men (66%) and 24 women (34%), the average age of the subjects was 48.7 ± 1.2 years. The average duration of the disease was 7.3 ± 0.52 years. The criteria for the diagnosis of arterial hypertension were considered to be a pressure of 140/90 mm Hg and more. Depending on the degree of arterial hypertension, the patients were divided into: grade I (140/90-159/99 mmHg) - 46 patients and grade II (160/100-179/99 mmHg) - 24 patients. An ultrasound device MINDRAY DC-7 (China) was used to examine the kidneys. Longitudinal and transverse scanning was performed in real-time mode with 3.5 MHz contextual sensors, in B-mode and in the mode of color mapping of blood flow and Dopplerography of renal vessels. The length, width, and thickness of both kidneys were determined in all patients. Then the volume of the kidneys was calculated according to the form proposed by Hricak H., V = 0.523ABC, where V is the volume of the kidney; A is the length; B is the width and C is the thickness of the kidney, and the total volume of the kidneys was calculated. The main and interrenal (segmental) renal arteries were examined.

Research results. The study of the main renal vessels was carried out in order to exclude their pathology (stenosis, abnormalities, etc.). When quantifying hemodynamic parameters, the following indicators were adhered to: maximum velocity (Vmax); minimum velocity (Vmin); average velocity (Vmed); pulsation index (Pi); resistivity index (Ri). The following values of hemodynamic parameters were obtained during ultrasound examination:

In the area of the mouth, the peak systolic velocity fluctuated in the right renal artery from 80.0 cm/s to 95.0 cm/s, with an average value of 86.0 cm/s. In the left renal artery, the peak systolic blood flow rate varied from 79.0 to 93.0 cm/s, with an average value of 84.0 cm/s. The final diastolic blood flow rate ranged in the right and left renal arteries from 26.0 to 29.0 cm/s, from 25.0 to 29.5 cm/s and an average of 27.5 and 27 cm/s, respectively.

The resistance index ranged in the right renal artery from 0.63 to 0.69 with an average value of 0.66, in the left artery from 0.64 to 0.7 with an average value of 0.67. In the right renal artery, the pulsation index varied from 0.88 to 1.0, in the left artery from 0.86 to 0.98 and an average value of 0.97 - 0.95, respectively.



Picture. 1. Echodopplerogram is normal. The renal artery.

(IR - 0.62; GTI - 1.03 p < 0.05)

In the distal region of the main trunk, the peak systolic velocity in the right renal artery ranged from 81.0 cm/s to 94.0 cm/s, with an average value of 87.8 cm/s. In the left renal artery, the peak systolic blood flow rate varied from 75.0 to 91.0 cm/s with an average value of 84.0 cm/s. The final diastolic blood flow rate ranged in the right and left renal arteries from 26.4 to 28.5 cm/s and from 24.5 to 28.0 cm/s and an average of 27.2 and 26.1 cm/s. accordingly. The resistance index ranged in the right renal artery from 0.65 to 0.73 with an average value of 0.68 in the left artery from 0.66 to 0.7 with an average value of 0.67. In the right renal artery, the pulsation index varied from 0.89 to 1.0, in the left artery from 0.82 to 0.1 and an average value of 0.96 - 0.93, respectively.

In the obtained data in the area of segmental arteries, the peak systolic velocity fluctuated in the right renal artery from 60.3 cm/s to 70.1 cm/s. with an average value of 65.5 cm/s. In the left renal artery, the peak systolic blood flow rate varied from 50.0 to 66.0 cm/s with an average value of 60.4 cm/s. The final diastolic blood flow rate ranged in the right and left renal arteries from 18.0 to 22.0 cm/s and from 19.0 to 26.0 cm/s and an average of 21.0 and 23.0 cm/s. accordingly.

Picture 2. Echodopplerogram is normal. Segmental artery.

(IR - 0.63; PI - 1.09 p < 0.05)

The resistance index ranged in the right renal artery from 0.62 to 0.64 with an average value of 0.63 in the left artery from 0.61 to 0.65 with an average value of 0.66 g. In the right renal artery, the pulsation index varied from 0.9 to 1.1. In the left artery, from 0.83 to 1.09 and an average value of 0.95 - 0.9, respectively.

Conclusion. Early echographic criteria for kidney damage in patients with arterial hypertension are an increase in linear blood flow and intra-renal vascular resistance in combination with an increased glomerular filtration rate.

List of used literature:

1. Алиев Ю.Г., Ганзен Т.Н., Григорьев Н.А. Трудности дифференциальной диагностикиксантогранулематозного пиелонефрита и рака почки. Пленум Всероссийского Общества урологов. Кемерово. 2005. С. 51 - 53.
2. Аляев Ю.Г., Чалый М.Е. Допплерография в диагностике опухолевого тромбоза при раке почки. //Актуальные вопросы лечения онкоурологических заболеваний. //Материалы 3-й Всероссийской научной конференции с участием стран СНГ. Москва, 2009. С. 171-173
3. Бреннер Б.М. Механизмы прогрессирования болезней почек. //Нефрология.—2009.—№ 4— С. 23-27.
4. Ольхова Е.Б., Крылова Е.М., Ефремова И. Возможности ультразвуковой оценки функционального состояния почек при рефлюкс нефро-патии у детей. // Эхография. -2010.-Т. 2,№1.-С. 61.67.
5. Пыков И.М. и др. Допплерографическая оценка уродинамики при обструктивных уропатиях у детей раннего возраста. //Ультразвуковая и функциональная диагностика. 2009. - №3. - С. 71.76.
6. Жуковский Г.С., Константинов В.В., Варламов Т.А., Капустина А.В. Артериальная гипертония, эпидимиопогаческая ситуация в России и других странах. РМЖ, Том 5 №9, 2007.
7. Мазур В.В. , Калинкин А.М., Замораев О.А., Мазур Е.С. Ремоделирование сердца у больных постинфарктным кардиосклерозом на разных стадиях хронической сердечной недостаточности. // Российский кардиологический журнал. 2008. - № 3. - С. 18-21.
8. Павлов А.А. Минимальный объем обследований при впервые выявленной артериальной гипертензии и организации диспансерного наблюдения в поликлинике. Мед.помощь, 2011. № 2, С. 19-21.
9. Erden A., Beduk Y., Karalezli G., Aytac S., Anafarta K., Safak M. Characterisation of renal masses with colour flow Doppler ultrasonography. // Br. J. Urol. 2013 Vol. 71 N. 6 P. 661-663.
10. Filippone A., Muzi M., Basilico R., Di Giandomenico V., Trapani A.A., Bonomo L. Color Doppler flow imaging of renal diseasese. //Radiol. Med (Torino). 2014. Vol. 87 N. 5 Suppl P. 50-58.
11. Kier R Taylor K.J., Feyock A.L., Ramos I.M. Renal masses characterization with Doppler US. // Radiology. - 2015. - Vol. 176, N 3. - P. 703-707.
12. Sandhu S. Statins for imnproving renal outcomes: a meta-analysis/ S. Sandhu et al. //J. Am. Soc.Nephrol. - 2006.- 17.- P. 2006-16.
13. Axmadova Maftuna Amin qizi .Ko'krak bezi-o'ziga xos intrakranial a'zo//JOURNAL OF ADVANCED REASERCH AND STABILITY(JARS)//Volume:01.05/2021.,171-180 bet.
14. Rakhmonovna, S. Z., & Sharipovna, A. N. (2020). Characteristics of exchange of essential microelements of copper and zinc in healthy fertilized women and women with combined copper and zinc deficiency state. *European Journal of Molecular & Clinical Medicine, 7*(1), 3332-3335.

15. Turdiyev,M. R., Teshayev Sh. J. Morphometric Assessment of Functional Immunomorphology of White Rat Spleen in the Age Aspect American Journal of Medicine and Medical Sciences 2019, 9(12): 523-526
16. AT Cho'liyev., US Mamedov., MA Akhmadova., RR Navro'zov., DF Narziyeva Diagnostics of exinococcosis in youth at the modern stage./Journal of Natural Remedies.2021,№1(1).-P37-40
17. Guljamol Fazliddinonvna Makhmudova, Adkhambek Uygunovich Nurboboyev.Treatment of mechanical jaundice via the modern way// Scientific progress, 2021.-№6.-P.530-537
18. Makhmudova G.F. Age-related clinical,anatomical and morphological features of malignant tumors of the cervix// Journal of science and technology//2021.-P.-475-480
19. Turdiev M.R., Teshaev Sh.J. Comparative characteristics of the morphological and morphometric parameters of the spleen of white rats in normal conditions, chronic radiation sickness and correction with a biostimulant // Problems of biology and Medicine - 2020. - No. 4 (120) - P. 160-165
20. AH Narzulloyevich, MG Fazliddinovna, KF Sharopovna// Comparison of the results of modern methods of treatment of elderly women with breast cancer// Eurasian Medical Research Periodical 3, 9-15.
21. Махмудова Г. Ф., Темирова, Д. В., &Баротова, Ш. Б. (2021). Бачадон бўйни хавфли ўсмаларининг ёшга хосхусусиятлари//Academicresearchineducationalsciences // 2(5).-Б.-186-196. https://doi.org/10.24411/2181-1385-202100871
22. Maxmudova G.F.,Soxibova Z.R., Mamedov U.S., Nurboboyev A.U. Fertil va keksa yoshli ayollarda bachadon bo'yni xavfli o'smalari tahlili (Buxoro viloyatida)//Oriental Renaissance: Innovative, educational, natural and social sciences//-2021.-V 8.-B. 175-184.
23. Nurboboyev A.U., Makhmudova G.F. Miniinvazive approach in the complex treatment of tumor and stone etiology of mechanical jaundice// International journal on Orange technology// Vol 3. Issue 9. Sep.2021.-P. 85-90
24. М.А. Ахмадова, А.Т.,Сохибова З.Р., Д.К. Худойбердиев.,Ж.Р.Нуров Диагностика эхинококкоза у молодёжи на современном этапе./Тиббиётда янги кун 2019 й.3(27)- стр 54-56
25. М.А. Ахмадова, А.Т. Чўлиев, Ж.Р. Нуров, Д.К. ХудойбердиевЛучеваядиагностикаэхинококкозапечени./Биологияватиббиётмуаммолари.2019,№4 .2(115)с.20-25
26. Сохибова З.Р.,Ахмадова М.А. Комплексная диагностика и хирургическое и хирургическое лечение осложненных форм эхинококкоза печени./OrientalRenaissance:Innovative,Educational, naturalandsocialsciences/2021й -стр 203-212.
27. НарзиеваД.Ф.ЗначениеИммуногистохимических маркеров при метастазировании рака молочной железы в легкие.// Oriental Renaissance:Innovtive,educational,natural and social sciences.// -2021 Vol.1-С.170-175
28. Abdullayev Habibulla Narzulloyevich, Makhmudova Guljamol Fazliddinovn, Makhmudova Anora Fazliddinovna// Age-related clinical and instrumental analysis of malignant tumors of the cervix// Eurasian Medical Research Periodical.-2021 Vol 3, 1-8.
29. Z.R. Sokhibova, M.R. Turdiyev, (**2021**). Some Features Of Laboratory Indicators Of Micro And Macro-Elementary Condition Of The Organism Of Female Age Women Innormality And In Iron Deficiency. *The American Journal of Medical Sciences and Pharmaceutical Research, **3(02)**,* MO- **145**.

30. Mamedov U.S., Pulatova D.SH. The Results of Cancer Treatment of the Oral Caviti Tumors in //the Republic of Uzbekistan European journal of Pharmaceutical and Medical Research. -2019. - 6(9). - P. 326-329.
31. Narziyeva D.F., Jonibekov J.J.; Morphological features of tumor in different treatment options for patients with locally advanced breast cancer // Middle European scientific bulletin.Volume 7- 2020-Dec. – P. 105-10
32. Nurov Jamshid Raxmatovich. Morphofunctional characters of the greater omentum // International Journal of Discoveries and Innovations in Applied Sciences. – 2021. – Vol. 1(5). – P. 130-134.
33. Nurov J.R., Khalikova F.S. Long-term results of surgical treatment patients with stomach cancer // Вестник науки и образования. – 2020. – №23-2(101). – С. 85-89.
34. Р.Р.Наврузов. Характеристика морфометрических параметров желудка белой крысы в раннем постнатальном периоде // Новый день в медицине. 2 (34/3) 2021 С.17-23
35. Р.Р.Наврузов. Морфологические и морфометрические изменения слоя желудка месячных белых крыс // Журнал Fогинновационных разработок в фармацевтической и технической науке (JIDPTS). Объем:4, Выпуск:5, Май:2021 стр. :(7-10)
36. Р. Р. Наврузов. Лимфотропная терапия в комплексе лечения гнойно-воспалительных заболеваний кисти в амбулаторных условиях // Новый день в медицине 30.2020
37. R. R. Navruzov. Morphofunctional features of the lymphoid structures of the colon in normal and under the influence of a biostimulator on the background of radiation sickness // Web of Scientist: International Scientific Research Journal Sep 8, 2021 Page: (53-56)
38. Р. Р. Наврузов., Тешаев Ш.Ж., Очилов К.Р., Худойбердиев Д.К. Сравнительная характеристика толстой кишки белых беспородных крыс при хронической лучевой болезни и после воздействия биостимулятора асд-2ф // Новый день в медицине 6 (38) 2021г. С. 272-276
39. Гафур Нормуродович Саидов, Учкун Гафурович Абдукаримов, Гулжамол Фазлиддиновна Махмудова. Эпидемиологические показатели первично-множественных опухолей (обзор литературы)// Биология и интегративная медицина// 2019№ 11 (39).-С.
40. Нуров Ж.Р. Послеоперационная аналитика раннего периода хирургического лечения злокачественной опухоли желудка // Oriental Renaissance: Innovative, educational, natural and social sciences. – 2021. – Vol. 1(8). – P. 185-191.
41. Sokhibova Z.R.,Akhmedova M.A. Complex diagnostics and surgical and surgical treatment of complicated forms of liver echinococcosis./Oriental Renaissance: Innovative, Educational, natural and social sciences/2021 -pp. 203-212.
42. Nurov Jamshid Raxmatovich, Narzieva Dilnoza Fakhriddinovna. The Significance of Immunohistochemical Markers in the Treatment of Breast Cancer // International journal on orange technology. – 2021. – Vol. 03(9). – P. 69-72.
43. Nurov Jamshid Raxmatovich, Ahmadova Maftuna Amin qizi. Features of Anatomy of the Greater Omentum // International journal on orange technology. – 2021. – Vol. 03(9). – P. 66-68.
44. Nurov Jamshid Raxmatovich, Narzieva Dilnoza Fakhriddinovna. Immediate Results of Surgical Treatment of Gastric Cancer // International journal on orange technology. – 2021. – Vol. 03(9). – P. 62-65.

45. Sokhibova, Z. R., & Turdiyev, M. R. (2021). Some Features Of Laboratory Indicators Of Micro And Macro-Elementary Condition Of The Organism Of Female Age Women Innormality And In Iron Deficiency. *The American Journal of Medical Sciences and Pharmaceutical Research*, *3*(02), 140-145.

46. MG Fazliddinovna, NA Uygunovich, ND Faxriddinovna The modern way of diagnosis of cervical pathology in women with uterine fibroids via the colposcopy//Web of scientist: international scientific research journal.-3(02), 1017-1027, 2022.

47. Mamedov U.S, Khalikova F. Sh. Advantages of Magnetic Resonance Computer Tomography in the Diagnosis of Thyroid Cancer //Pindus Journal of Culture, Literature, and ELT. – 2021. – T. 9. – C. 80-84.

48. Axmedov Farxod Xakimovich// CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES// Морфологические Изменения Внутри И Внепеченочных Протоков, И Сфинктеров У Больных С Желчекаменной Болезнью, Постхолецистэктомии. Volume: 02 Issue: 05 | Sep-Oct 2021

49. Xudoyberdiyev Dilshod Karimovich CHARACTERISTICS OF MORPHOMETRIC PARAMETERS OF THE WHITE RAT'S STOMACH IN THE EARLY POSTNATAL PERIOD// Тиббиётда янги кун// 2 (34/3) 2021 С-17-23

50. Xudoyberdiyev Dilshod Karimovich ОҚ КАЛАМУШЛАР ЙЎҒОН ИЧАГИ СУРУНКАЛИ НУР КАСАЛЛИГИДА ВА БИОСТИМУЛЯТОРЛАР ТАЪСИРИДАН КЕЙИНГИ ҚИЁСИЙ ХУСУСИЯТЛАРИ// Биология ва тиббиёт муаммолари// 2021, №3 (128)

51. Xudoyberdiyev Dilshod Karimovich МОРФОЛОГИЧЕСКИЕ И МОРФОМЕТРИЧЕСКИЕ ИЗМЕНЕНИЯ СТЕНКИ ЖЕЛУДКА ОДНОМЕСЯЧНЫХ БЕЛЫХ КРЫС// INTERDISCIPLINARY RESEARCH: SCIENTIFIC HORIZONS AND PERSPECTIVES International Scientific and Theoretical Conference// March 12, 2021 С 57-61

52. Axmedov Farxod Xakimovich SCIENTIFIC COLLECTION «INTERCONF» COMPARATIVE MORPHOMETRY OF INTRA AND EXTRAHEPATIC BILIARY TRACT, BILIARY SPHINCTERS IN PATIENTS WITH CHOLELITHIASIS WHO UNDERWENT CLASSICAL AND LAPAROSCOPIC CHOLECYSTECTOMY № 78 | October, 2021 P-325-327

53. Sultanova L. The Dj.Nuraliyev N.A.Indicators of Seeding of Microorganisms translated from the Large Intestine to Internal Oragans under the Influence of Acuteationation in the Experiment//American Journal of Medicine and Medical Sciences//Volume 10, Number 11,Novembr 2020.p-929-932

54. G.F.Makhmudova Colposcopic analysis of cervical pathology in women with uterine fibroids//Scientific progress// 3(1), 289-296,2022

55. А.У. Нурбобоев, МС Шаропова, А.Ф. Махмудова Турли этиологияли механик сарикликни даволашда замонапвий минилапаратом усуллар// Scientific progress// 3(1), 713-721, 2022