International Journal of Medical Sciences And Clinical Research (ISSN – 2771-2265)
VOLUME 02 ISSUE 06 Pages: 15-21
SJIF IMPACT FACTOR (2021: 5. 694) (2022: 5. 893)
OCLC – 1121105677 METADATA IF – 5.654
Publisher: Oscar Publishing Services

Journal Website: https://theusajournals.com/index.php/ijmscr

Research Article

THE ROLE OF METANEPHRINS IN ARTERIAL HYPERTENSION CAUSED BY MALIGNANT PHEOCHROMOCYTOMA

Submission Date: June 10, 2022, Accepted Date: June 20, 2022,
Published Date: June 30, 2022
Crossref doi: https://doi.org/10.37547/ijmscr/Volume02Issue06-04

M.D. Juraev
Samarkand branch of the Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology, Uzbekistan

D.Yu. Mamarizaev
Samarkand branch of the Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology, Uzbekistan

Raximov N.M
Samarkand branch of the Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology, Uzbekistan

Shaxanova Sh.Sh
Samarkand branch of the Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology, Uzbekistan

ABSTRACT

The article presents the results of surgical treatment of 40 patients with pheochromocytoma. Patients have a significant increase in the level of metanephrine in the urine. The study determined the relationship between the course of hypertension and the size of the tumor, the concentration of metanephrines and the duration of the disease.

KEYWORDS

Arterial hypertension, pheochromocytoma, metanephrine, normetanephrine.

International Journal of Medical Sciences And Clinical Research (ISSN – 2771-2265)
VOLUME 02 ISSUE 06 Pages: 15-21
SJIF IMPACT FACTOR (2021: 5. 694) (2022: 5. 893)
OCLC – 1121105677 METADATA IF – 5.654
Publisher: Oscar Publishing Services

INTRODUCTION

According to the World Health Organization, the number of free people with hypertension is steadily increasing. Among all patients with arterial hypertension, arterial hypertension of adrenal etiology accounts for from 1 to 2.5%.

It is known that arterial hypertension of adrenal etiology is difficult to stop with medication. The only radical and effective method of treatment is surgical removal of an adrenal tumor. [2,5]

Along the course of arterial hypertension, paroxysmal, permanent and mixed forms can be distinguished.

The paroxysmal form of the disease is characterized by a sudden sharp increase in blood pressure (sometimes up to 300 mmHg and higher). Outside of an attack of a hypertensive crisis, blood pressure is usually normal.

According to multicenter studies, hypertensive crises that occur against the background of initially normal blood pressure are tolerated by patients much more severely than hypertensive crises that occur against the background of initial hypertension. [7,9]

The permanent form of arterial hypertension is characterized by a persistent increase in blood pressure without episodes of a hypertensive crisis and resembles essential hypertension along the course, it is less common.

The mechanism of development of stable arterial hypertension in patients with pheochromocytoma is not fully established.

In patients with a mixed form of arterial hypertension, crises occur against the background of a constantly elevated blood pressure of 160-170 / 100-110 mmHg.

The intensity of crises in patients with mixed hypertension is less pronounced compared to patients with paroxysmal hypertension. Symptoms of chronic damage to the cardiovascular system in these patients are more common.

During a hypertensive crisis, blood pressure rises to 250-270 / 140-160 mmHg. The clinical picture of the disease in these patients is somewhat weaker than in patients with paroxysmal hypertension. [1,2,4,5]

Excessive intake of catecholamines into the blood leads to the development of tachycardia, an increase in systemic vascular tone, increases the contractility of the myocardium and venous insufficiency. The causes of the development of arterial hypertension of various forms of paroxysmal, permanent and moderate hypertension remain unclear. Some authors talk about the possible existence of a certain connection between the histological structure of pheochromocytoma and the nature of arterial hypertension, but these assumptions do not have an evidence base. [3,6,8]

OBJECTIVE

To determine the relationship between the concentration of adrenal hormones and the type of hypertension in patients with pheochromocytoma.

MATERIALS AND METHODS

In the Samarkand branch of the Republican Specialized Center of Oncology and Radiology in the period from 2015 to 2021, 40 patients with pheochromocytoma were examined and treated.

Distribution of patients by gender: women 28 (70.0%), men 12 (30.0%). Between the ages of 16 and 69. The average age is 39.7±6.1 years. The duration of

International Journal of Medical Sciences And Clinical Research (ISSN – 2771-2265)
VOLUME 02 ISSUE 06 Pages: 15-21
SJIF IMPACT FACTOR (2021: 5. 694) (2022: 5. 893)
OCLC – 1121105677 METADATA IF – 5.654
Publisher: Oscar Publishing Services

hypertension ranged from 6 months to 10 years and averaged 4.2±1.7 years.

Patients were divided into two groups in group I of 20 (50%) patients with pheochromocytoma, preoperative preparation was carried out using an alpha-adrenoblocker (doxazosin 2-16mg). In group II, 20 (50%) patients were prepared with antihypertensive drugs Amless 4mg/5mg; 8mg/10mg.

In group I patients, the duration of preoperative preparation ranged from 7 to 15 days, on average 10.2 ± 1.5 days, in group II patients, the duration ranged from 9 to 18 days, on average 13.5 ± 1.8 days.

The patients were comprehensively examined, general clinical, biochemical, hormonal, radiation research methods were carried out, according to the therapeutic and diagnostic algorithm worked out in the clinic.

As instrumental research methods, patients underwent ultrasound (including intraoperative), computed tomography (CT), magnetic resonance imaging (MRI)

In preparation for the operation, the state of the cardiovascular system and central hemodynamics, daily blood pressure monitoring, echocardiography were also examined, the cardiovascular and respiratory systems were monitored intraoperatively. The above-mentioned methods of pheochromocyte examination made it possible to adequately assess the functional reserves of the body of the operated patients, to carry out their targeted correction and prevention of complications at all stages of the perioperative period.

RESULTS AND DISCUSSIONS

We also studied the relationship between the course of different variants of arterial hypertension depending on the concentration of metanephrines in the daily urine.

Distribution of patients along the course of hypertension depending on the level of metanephrines.

Form of arterial hypertension	Metanephrine (mcg/day)	Normetanephrine (mcg/day)
Paroxysmal form of arterial hypertension n 11 (27,5%)	1080,7 [from 940,3 to 2100,5]	1000,5 [from 912 to 1500,5]
Permanent form of arterial hypertension n 14 (35%)	980,5 [from 810,4 to 1400,8]	898,4 [from 830,5 to 1170]
Mixed form of arterial hypertension n 15 (37,5%)	1810,7 [from 1625 to 2200,5]	1640,6 [from 1490 to 2145]

International Journal of Medical Sciences And Clinical Research (ISSN – 2771-2265)
VOLUME 02 ISSUE 06 Pages: 15-21
SJIF IMPACT FACTOR (2021: 5. 694) (2022: 5. 893)
OCLC – 1121105677 METADATA IF – 5.654
Publisher: Oscar Publishing Services

Analyzing the above table, we can conclude that there is a relationship between the concentration of metanephrines and the type of hypertension.

In patients with paroxysmal hypertension, the daily urine metanephrine ranged from 940.3 to 2100.5 mcg/day, on average 1080.7 mcg/day. Normetanephrine daily urine ranged from 912 to 1500.5 mcg / day on average 1000.5 mcg / day.

In patients with a constant form of hypertension, the daily urine metanephrine ranged from 810.4 to 1400.8 mcg /day, on average 980.5 mcg/ day. Normetanephrine daily urine ranged from 830.5 to 1170 mcg / day on average 898.4 mcg / day.

In patients with mixed hypertension, the daily urine metanephrine ranged from 1625 to 2200.5 mcg/day, on average 1810.7 mcg/day. Normetanephrine daily urine ranged from 1490 to 2145 mcg / day on average 1640.6 mcg / day.

We also studied the content of metanephrine in daily urine depending on the size of the tumor.

The level of metanephrins depending on the size of the.

Dimensions	Metanephrine of daily urine mcg/day	Normetanephrine of daily urine mcg/day
≤2,9 centimeters' (n 11)	942 [from 819,4 to 1240,5]	963 [from 859 to 1405]
от 3,0 до 6,9 centimeters' (n 17)	1060,2 [from 874 to 1459,5]	980,4 [from 836,5 to 1470]
≥7 centimeters' (n 12)	1810 [from 1465 to 2209,5]	1420,1 [from 1280 to 2140,5]

According to the results of the study, we see that with an increase in the size of pheochromocytes, the concentration of secreted metanephrines increases.

We also studied the dependence of the concentration of metanephrines on the duration of the disease.The level of metanephrines in the daily urine, depending on the duration of pheochromocytomas.

The duration of the disease	Metanephrine of daily urine mcg/day	Normetanephrine of daily urine mcg/day
from 12 to 35 months (n 12)	860 [from 819,4 to 1070]	841,5 [from 830,5 to 971,8]
from 36 to 60 months (n 14)	1420,5 [from 1100 to 1610,1]	1270,4 [from 920,7 to 2040,5]
≥ 60 months (n 14)	1340,3 [from 995 to 2105,5]	1072,4 [from 964,1 to 1442]

International Journal of Medical Sciences And Clinical Research (ISSN – 2771-2265)
VOLUME 02 ISSUE 06 Pages: 15-21
SJIF IMPACT FACTOR (2021: 5. 694) (2022: 5. 893)
OCLC – 1121105677 METADATA IF – 5.654
Publisher: Oscar Publishing Services

Having studied the dependence of the concentration of metanephrine in daily urine on the duration of the disease, we did not find a reliable relationship.

We can conclude that the determination of the level of metanephrins and vanillylmindal acid is the main differential diagnostic feature. High levels of metanephrine and normetanephrine in the daily urine do not reliably determine the different types of hypertension.

Preoperative preparation of patients with pheochromocytoma is one of the main components of complex treatment, preparation should be carried out correctly and adequately, since the outcome of the operation largely depends on it.

Before surgery, target organs suffering from prolonged hypercatecholaminemia should be thoroughly investigated. Preoperative preparation of patients with pheochromocytoma was carried out depending on the following factors: duration of arterial hypertension, general condition of the patient, intensity and frequency of hypertensive crises, tumor size, condition of target organs, age, gender and presence of hypovolemia.

In group I, 20 (50%) patients with pheochromocytoma, preoperative preparation was carried out using an alpha-adrenoblocker (doxazosin 2-16mg). In group II, 20 (50%) patients were prepared with antihypertensive drugs Amless 4mg/5mg; 8mg/10mg.

In group I patients, the duration of preoperative preparation ranged from 7 to 15 days, on average 10.2 ± 1.5 days, in group II patients, the duration ranged from 9 to 18 days, on average 13.5 ± 1.8 days.

Patients of both groups had approximately the same blood pressure figures upon admission to the hospital.

Blood pressure indicators of patients in the perioperative period.

Blood pressure indicators (mmHg)	I group of patients	I group of patients
Average blood pressure at admission	230,5±11,2/129,3±9,6	227,1±9,4/124,8±6,9
Average blood pressure before surgery	147,8±3,5/89,6±3,1	170,3±4,9/105,5±5,4
Increase in blood pressure during surgery on average	178,7±4,7/105,3±4,2	208,4±7,2/115,5±5,2

As we can see from the table, in patients of group I who received doxazosin 2-16 mg in the preoperative period, blood pressure significantly decreased compared to patients of group II.

Our studies have shown that in order to prevent the development of the syndrome of "uncontrolled hemodynamics" and life-threatening conditions associated with it, all patients should undergo

International Journal of Medical Sciences And Clinical Research (ISSN – 2771-2265)
VOLUME 02 ISSUE 06 Pages: 15-21
SJIF IMPACT FACTOR (2021: 5. 694) (2022: 5. 893)
OCLC – 1121105677 METADATA IF – 5.654
Publisher: Oscar Publishing Services

preoperative preparation with the use of the a-blocker doxazosin, regardless of blood pressure and other indicators.

CONCLUSIONS

Our research demonstrates that for the prevention of uncontrolled hemodynamics and the prevention of life-threatening conditions, in the preoperative period, all patients should be prescribed an adrenoblocker – doxazosin at a dose of 2 to 16 mg, regardless of the initial blood pressure level. The favorable therapeutic effect of the use of adrenoblockers is reported in the works of most domestic and foreign authors.

REFERENCES

1. Bragina Z. N., Polyakova S. M. On THE ISSUE OF HEOCHROMOCYTOMA OF THE ADRENAL GLANDS //BBK 52.5 ya73 FROM 56. – 2022. – P. 52.
2. Gnilitskaya V. B., Hristulenko A. L., Stulikova E. L. GOO VPO DonNMU named after M. Gorky Department of Therapy FIPO named after Prof. AI Dyadyka Pheochromocytoma and arterial hypertension (AH).
3. Kvachenyuk A. N., Kvachenyuk D. A. Features of management of patients with malignant tumors of the medulla of the adrenal glands //International Journal of Endocrinology. 2018. – Vol. 14. – No. 8.
4. Platonova N. M. et al. PHEOCHROMOCYTOMA //Collection of methodological recommendations. – 2017. – pp. 75-94.
5. Yakovleva E. V. et al. Pheochromocytoma with a permanent form of arterial hypertension //Archive of Internal Medicine. – 2019. – T. 9. – №. 4 (48). – Pp. 316-322.
6. Leung A. A. et al. Epidemiology of pheochromocytoma and paraganglioma: population cohort study //European Journal of Endocrinology. – 2021. – Vol. 184. – No. 1. – pp. 19-28.
7. Nelting S. et al. Personalized treatment of pheochromocytoma and paraganglioma //Endocrine reviews. – 2022. - p. 43. – No. 2. – p. 199-239.
8. Nelting S. et al. Modern treatment of pheochromocytoma/paraganglioma: a guide for the practitioner in the era of precision medicine //Oncological diseases. – 2019. – Vol. 11. – No. 10. – p. 1505.
9. Zavadzka K. et al. Selective and non-selective alpha blockade before adrenalectomy for pheochromocytoma: a systematic review and meta-analysis //European Journal of Endocrinology. – 2021. – Vol. 184. – No. 6. – pp. 751-760.
10. Said Abdurakhmanovich Babayev, Shavkat Satiboldievich Bekturdiev, Nodir Mahammatkulovich Rakhimov, Dilfuza Zuhriddinovna Jalalova, Dildora Zuhriddinovna Yusupova, Shakhnoza Shavkatovna Shakhanova. Assessment of the state of immunity in patients with tumors. 2021/6/12. Central asian journal of medical and natural sciences. Том 2, № 3. P 218-225.
11. Mirdjalol Dehkanovich Djuraev, Nodir Maxammatkulovich Rahimov, Mavluda Nigmatovna Karimova, Shakhnoza Shavkatovna Shakhanova. Current Views On The Pathogenesis Of The Parietal-Visceral Pathway Of Gastric Cancer Metastasis. The American Journal of Medical Sciences and Pharmaceutical Research, 2021/3/31. Том 3, № 03, P 94-103.
12. Shakhanova Sh Sh, MD Djuraev, NM Rakhimov, MN Karimova, AF Asatulayev. Determination Of Risk Parameters In The Detection Of

International Journal of Medical Sciences And Clinical Research (ISSN – 2771-2265)
VOLUME 02 ISSUE 06 Pages: 15-21
SJIF IMPACT FACTOR (2021: 5. 694) (2022: 5. 893)
OCLC – 1121105677 METADATA IF – 5.654
Publisher: Oscar Publishing Services

Asymptomatic Bone Metastases Of Kidney And Prostate Cancer. The American Journal of Medical Sciences and Pharmaceutical Research 2021/2/28, Том 3, № 02, P 161-174.

13. Ziyadullaev S. K. et al. MARKER TNFα-308G/A IN PATIENTS WITH RELATIVE BLADDER CANCER //Oriental renaissance: Innovative, educational, natural and social sciences. – 2021. – Т. 1. – №. 8. – С. 926-932.