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COMPREHENSIVE ASSESSMENT OF HEMODYNAMIC PARAMETERS IN PATIENTS WITH COMPLICATIONS OF INCREASED INTRA-ABDOMINAL PRESSURE

F. F. Azizova
Military Medical Academy of the Armed Forces of the Republic of Uzbekistan
Uzbekistan

M. G. Mukhamedova
Military Medical Academy of the Armed Forces of the Republic of Uzbekistan
Uzbekistan

ABOUT ARTICLE

Key words: hemodynamic parameters, intra-abdominal pressure, significant impact, intracardiac hemodynamics.

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Abstract: This article discusses the comprehensive assessment of hemodynamic parameters in patients with complications of increased intra-abdominal pressure. Increased intra-abdominal pressure has a significant impact on the parameters of intracardiac hemodynamics, diastolic and systolic functions of the heart, as well as on blood flow in the main and peripheral vessels.

QORIN BO'SHLIG'I BOSIMI ORTISHI BILAN OG'RIGAN BEMORLARDA GEMODINAMIK KO'RSATKICHLARNI HAR TOMONLAMA BAHOLASH

F. F. Azizova
O‘zbekiston Respublikasi Qurolli Kuchlari Harbiy tibbiyot akademiyasi
O'zbekiston

M. G. Muhamedova
O‘zbekiston Respublikasi Qurolli Kuchlari Harbiy tibbiyot akademiyasi
O'zbekiston

MAQOLA HAQIDA

Kalit so‘zlar: gemodinamik ko'rsatkichlar, qorin bo'shlig'i bosimi, sezilarli ta'sir, intrakardiyak gemodinamika.

Annotatsiya: Ushbu maqolada qorin bo'shlig'i bosimi ortishi bilan og'rigan bemorlarda gemodinamik ko'rsatkichlarni har tomonlama baholash muhokama qilinadi. Qorin bo'shlig'i ichidagi bosimning oshishi intrakardiyak gemodinamikaning parametrlariga, yurakning diastolik va sistolik funktsiyalariga, shuningdek, asosiy va periferik

tomirlardagi qon oqimiga sezilarli ta'sir ko'rsatadi.

КОМПЛЕКСНАЯ ОЦЕНКА ПОКАЗАТЕЛЕЙ ГЕМОДИНАМИКИ У БОЛЬНЫХ С ОСЛОЖНЕНИЯМИ ПОВЫШЕННОГО ВНУТРИБРЮШНОГО ДАВЛЕНИЯ

Ф. Ф. Азизова
Военно-медицинская академия Вооруженных Сил Республики Узбекистан
Узбекистан

М. Г. Мухамедова
Военно-медицинская академия Вооруженных Сил Республики Узбекистан
Узбекистан

О СТАТЬЕ

Ключевые слова: гемодинамические параметры, внутрибрюшное давление, значимое воздействие, внутрисердечная гемодинамика.

Аннотация: В статье рассматривается комплексная оценка гемодинамических показателей у больных с осложнениями повышенного внутрибрюшного давления. Повышение внутрибрюшного давления оказывает существенное влияние на показатели внутрисердечной гемодинамики, диастолическую и систолическую функции сердца, а также на кровоток в магистральных и периферических сосудах.

Introduction

Increased intra-abdominal pressure (IAP) is a serious complication that can have significant impact on various body systems, including the cardiovascular system (1,2). IAP causes a disruption of venous return, increases the afterload on the heart and can lead to serious changes in blood circulation, both in the main vessels and in the peripheral microcirculation (4). In conditions of increased IAP, both diastolic and systolic disturbances of cardiac function are possible, which requires a detailed comprehensive assessment of the parameters of intracardiac hemodynamics (3.5).

Purpose of the study - to analyze the results of a hemodynamic study in patients with a complication in the form of increased intra-abdominal pressure.

Materials and methods of research. The criteria for safety include inclusion and exclusion of 364 patients. The main group (MG) consisted of 163 patients (44.8%) with extraperitoneal hypertension VBG- (VBH+), and subgroup A - patients with VBH+ with concomitant cardiac pathology were composed of 94 patients (57.7% of patients MG), subgroup V - 69 (42.3%) without concomitant cardiac pathology (table 2.3). The comparison group (CG) consisted of 201 patients (55.2% of the total number of patients) with normal IAP (VBH-). Subgroup A CG consisted of 86 patients with VBH-related cardiac pathology (42.8% of GS patients), subgroup V CG - 115

patients (57.2%) without concomitant cardiac pathology (table.1).

Table 1.

Distribution of patients to my group and subgroup

Group	A subgroup, patency with CP		Subgroup V patency without CP		total	
	n	%	n	%	n	%
MG - the main group, patient with elevated IAP	94	57,7%	69	42,3%	163	44,8%
CG comparison group, patients without IAP	86	42,8%	115	57,2%	201	55,2%

Note: IAP - intra-abdominal pressure; CP - cardiac pathology.

The research methods included: biochemical: ALT, AST, determination of MB-CPK and Troponin-T content in the blood, coagulogram, blood pressure monitoring, ECG monitoring, echocardiographic examination, ultrasound of the abdominal organs, measurement of intra-abdominal pressure with a Faley catheter according to the S.E. Bradley and G.P. Bradley method, X-ray examination of the chest and abdominal organs (X-ray diagnostic apparatus “Spectrum-X-ray _Gamma” SRG), statistical processing of the results.

Research results. In patients of the main group with increased IAP (IAP+), significant changes in intracardiac hemodynamic parameters were observed compared to the comparison group (IAP-). Thus, the average ejection fraction (EF) in patients of subgroup A of the MG was 45.2 ± 3.7%, which is significantly lower than in subgroup A of the GS (55.4 ± 2.9%, $p < 0.05$). In subgroup B of the MG, the average EF was slightly higher - 49.8 ± 4.1%, but also differed from the indicators of subgroup B of the GS (58.2 ± 3.1%, $p < 0.05$).

Table 2.

Evaluation of intracardiac hemodynamics and blood flow in subgroups

Subgroup	Ejection fraction (%)	E/A	Vascular resistance index (VRI)	Peripheral blood flow (units)
MG Subgroup A	45,2	0,9	1,5	12,3
MG Subgroup B	49,8	1,1	1,4	13,5
GS Subgroup A	55,4	1,0	1,1	15,8
GS Subgroup B	58,2+3,1	1,2	1,0	16,3

Parameters of diastolic function, such as the E/A ratio, also indicated impairment in patients with elevated IAP. In subgroup A of the OG, the E/A ratio was 0.9 ± 0.1, indicating type I diastolic dysfunction, while in subgroup B of the MG this indicator was 1.1 ± 0.2, indicating more severe impairment.

Blood flow analysis in the main vessels showed an increase in peripheral resistance in patients with IAP+. In particular, patients in subgroup A of the MG showed a significant increase in the vascular resistance index (VRI) in the carotid arteries and pulmonary artery compared to the comparison group. The average TDF in the carotid artery in patients with IAP+ was 1.5 ± 0.2 (in

subgroup A), while in the comparison group this indicator was at the level of 1.1 ± 0.1.

Patients with increased IAP showed significant microcirculation disorders in peripheral tissues. The results of laser Doppler flowmetry showed a decrease in tissue blood flow in the lower extremities in MG patients. In subgroup A MG, the average peripheral blood flow was 12.3 ± 1.1 units, which is significantly lower compared to the indicators of subgroup A GS (15.8 ± 1.2 units).

Thus, the increase in intra-abdominal pressure has a significant effect on the cardiovascular system, causing both diastolic and systolic disturbances. This study shows that patients with IAP+ experience significant changes in both intracardiac hemodynamic parameters and in the state of blood flow in the main and peripheral vessels.

Diastolic dysfunction in patients with IAP+ is more pronounced, especially in patients with concomitant cardiac pathology. This may be due to the additional load on the myocardium caused by increased afterload and impaired venous return, as evidenced by a decrease in the E/A ratio and an increase in the vascular resistance index.

In addition, IAP causes significant disturbances in peripheral blood flow, which can lead to ischemic changes in tissues, especially in the lower extremities. This is confirmed by the results of laser Doppler flowmetry, which showed a decrease in microcirculation in patients of the main group.

Conclusion

1. Increased intra-abdominal pressure has a significant impact on the parameters of intracardiac hemodynamics, diastolic and systolic functions of the heart, as well as on blood flow in the main and peripheral vessels.

2. Patients with IAP+ demonstrate more pronounced changes in cardiac function and peripheral microcirculation compared to patients with normal IAP. A comprehensive assessment of these parameters is important for diagnosis and selection of treatment tactics for this group of patients.

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