

Case Study

Metabolic syndrome in the affected structure with limbs fractures

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Accepted 17 July, 2019

The paper studied metabolic syndrome in the structure of victims with broken limbs. Analyzed the results of examination and surgical treatment of 202 patients with fractures of the limbs on the background of metabolic syndrome. Multidisciplinary approach was developed involving cardiologist, endocrinologist, anaesthetist and expert in resuscitation for planning surgical intervention can reduce intra and postoperative complications.

Keywords: metabolic syndrome; limb fractures; intramedullary osteosynthesis blocking; central venous pressure.

INTRODUCTION

Metabolic syndrome (MS) is a complex of interrelated disorders of carbohydrate and fat metabolism, as well as mechanisms of regulation of blood pressure (BP) and endothelial function, the development of which is insulin resistance [1,2,3,4,5,6].

The prevalence of metabolic syndrome (MS) in the adult population reaches 25.8% and increases significantly with age [7].

The available literature has not sufficiently studied the structure of victims with limb fractures, the effect of surgery on the results of treatment, against the background of the metabolic syndrome. Not developed a systemic approach, taking into account hypertension, diabetes mellitus, before and after surgical treatment. Taking into account the gerontological age of all injured

patients, the goal was set - to study the structure of the victims of long bone fractures, against the background of the metabolic syndrome.

MATERIAL AND METHODS

The results of the treatment of 202 patients with fractures of the limb, on the background of the metabolic syndrome, in the period from 2015 to 2017 were studied. Men 78 people (39%), women 124 people (61). The average age of patients was 69 years. Of these, 21 closed fracture of the humerus, closed fracture of the femoral neck, 91 cases, closed fracture of the femur diaphysis, 31 cases, closed fracture of the bones of the tibia, 59 cases.

Table 1: Patients with limb fractures

Closed humerus fracture	21
Closed femoral neck fracture	91
Closed fracture of the femur diaphysis	31
Closed shin bones fracture	59

140 (69.3%) patients underwent the following surgical intervention: closed Intramedullary osteosynthesis blocking (IOSB) of the femoral diaphysis 11, open osteosynthesis of the proximal femur 10 cases, closed osteosynthesis of the femoral neck using the spokes 31

cases. Closed leg diaphysis IOSB 9 cases, osteosynthesis with screws for 46 cases, closed IOSB shoulder 3, closed shoulder osteosynthesis with needles for 30 cases.

Table 2: Patients underwent the following surgery

Closed IOSB diaphysis	11
Open osteosynthesis of the proximal femur	10
Closed osteosynthesis of the femoral neck with needles	31
Closed IOSB leg diaphysis	9
Osteosynthesis with screws	46
Closed IOSB shoulder	3
Closed shoulder osteosynthesis with needles	30

RESULTS AND DISCUSSION

143 (70%) cases were observed leading in frequency of metabolic syndrome: Of the 202 patients examined, ischemic heart diseases (IHD) and hypertension were observed, a history of myocardial

infarction and acute cerebral circulation disturbance in 27 (13.3%) patients. Diabetes mellitus 46 (23%), impaired glucose tolerance 56 (28%), obesity in 112 (56%) patients, cholelithiasis 89 (44%), chronic pyelonephritis and urinary tract infections 96 (47.5%) others.

Table 3: Leading in frequency of metabolic syndrome

Coronary artery disease and hypertension	143 (70%)
Diabetes mellitus	46 (23%)
Impaired glucose tolerance	56 (28%)
Obesity	112 (56%)
Gallstone disease	89 (44%)
Chronic pyelonephritis and urinary tract infections	96 (47.5%)

More often they were observed in combination. With the onset of a fracture in patients, an exacerbation of chronic pathology was observed: the cardiovascular system, hypertensive crisis, acute coronary syndrome, hypercoagulable syndrome. Increased blood sugar, hypovolemic shock, violation of a number of biochemical parameters of blood, etc. All these pathological conditions exacerbate the course of traumatic disease. Prior to the operating period, joint adjustments were

required, by a cardiologist, an endocrinologist, an anesthesiologist, and a resuscitator. All patients were investigated according to the developed algorithm - a multidisciplinary approach. The examination included: complete blood count, formula, coagulogram, blood biochemistry, blood sugar dynamics, ECG, EchoCS, duplex examination of the vessels of the lower limb over time. 30.7% (62) of patients with a deterioration of somatic status, absolute contraindications of anesthesia,

it was decided to transfer to conservative treatment. A study on comorbidity revealed that all patients have two or more pathologies. Two different pathologies (86 people, 42.5%). The combination of the three pathologies was observed in 79 people (39.2%). In 37 patients, four or more pathologies were observed (18.3%). Examination of hemocoagulation status revealed that almost all patients showed an increased risk of thromboembolic complications, coagulation beginning 2.2 end 3.1; the amount of fibrinogen reached 550 ± 0.6 g/l. and higher. This and other indicators of the blood coagulation system indicated a high risk of thromboembolic complications. Indicators of central venous pressure (CVP) in the examined patients showed an average of 60-40 (normal 80-120) mm water column. CVP of patients was characterized by a decrease in the volume of circulating blood — hypovolemia, decrease in cardiac output, hypoxia of a predominantly circulatory type. All this ultimately led to an increase in hypovolemic shock. Given the age, injury, difficult compensation of hypovolemic shock, is an aggravating factor for the victim. At the same time, CVP is an important diagnostic information in predicting the general condition of the victim. The level of central venous pressure (CVP), that is, the pressure in the right atrium, has a significant effect on the amount of venous return of blood to the heart. With a decrease in pressure in the right atrium from 0 to - 4 mm Hg. the inflow of venous blood increases by 20-30%, but when the pressure in it becomes lower than -4 mmHg, a further decrease in pressure does not cause an increase in the inflow of venous blood. This lack of influence of a strong negative pressure in the right atrium on the amount of venous blood flow is explained by the fact that in the case when the blood pressure in the veins becomes sharply negative, there is a collapse of the veins flowing into the chest. If the decrease in CVP increases the flow of

venous blood to the heart through the hollow veins, then its increase by 1 mm Hg. reduces venous return by 14%. Consequently, the increase in pressure in the right atrium to 7 mm Hg. should reduce the flow of venous blood to the heart to zero, which would lead to catastrophic hemodynamic disturbances.

CONCLUSION

It was concluded that patients with fractures of long bones, against the background of the metabolic syndrome, belong to the somatically severe category of patients. The findings indicate that a differentiated approach reduces intra and postoperative complications. A multidisciplinary approach involving a cardiologist, an endocrinologist, an anesthesiologist, and a resuscitator is required to plan an intervention.

REFERENCES

1. Ginzburg M.M. Obesity and metabolic syndrome. Impact on health, prevention and treatment. - Samara: Sail - 2000. - 160 p.
2. Obesity. Metabolic syndrome. Type 2 diabetes. // underreview of acad. RAMS I.I. Dedova. - M., 2000. - p. 111
3. Butrova S.A. Metabolic syndrome: pathogenesis, clinic, diagnosis, treatment approaches // Russian Medical Journal. - 2001. - №2. - p. 56-60
4. Ametov A.S. Obesity is an epidemic of the XXI century // Therapeutic archive. - 2002. - №10. - p. 5-7.
5. Anderson E.A., Critchley J.A., Chan J.C. et.al. Factor analysis of obesity and insulin resistance as the central abnormality. // int. J. Obes. Relat. Metab. Disord. - 2001. V.25, №12. - P. 1782-1788.
6. Haffner S.M. Obesity and metabolic syndrome: the San Antonio Heart Study. // Wh. J. Nutr. - 2000. V. 83, Suppl. 1. - P. 67-70].
7. Pivovarova O.A., Doroshenko T.V., Linnichenko E.R., Maslyaeva N.Yu. Effect of metabolic syndrome on the development of osteoarthritis Ukrainian Morphological Almanac, 2010, Volume 8, Number 2 P. 261-262.