



Peculiarities of Treatment and Nutrition in Obese People Affected by Polytrauma

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Abstract

Introduction: Obesity rates have continued to increase recently, what is connected to the reduction of physical activity of population.

The Aim: To determine the peculiarities of treatment and nutrition of obese patients who suffered from Polytrauma.

Materials and Methods: Clinical material composed of 67 patients who sustained severe concomitant body trauma.

Results: On the grounds of the long-term outcomes assessment cards developed by us, treatment of the severe concomitant trauma in persons with obesity, we found typical complications of the traumatic disease, which family physicians faced on an ambulatory stage. These cards contained by system analysis of consequences of the sustained polytrauma on the systems and organs respectively to the body mass index meaning. In general, treatment and nutrition of such patients was complex and included applying of the diet therapy (a low-calorie diet with enough protein, vitamins and low levels of animal fats and carbohydrates, especially easily digestible), pharmacological therapy (antibiotics, mucolytics, solvents) as well as therapeutic exercise, which played almost dominant role. In particular, therapeutic massage was prescribed for improvement of general body tone, activation of peripheral circulation and lymph flow, oxidation-reduction and metabolic processes, retroaction to the impaired motor-evacuation function of the large intestine, eliminating fatigue and increasing muscle tone and functioning.

Conclusions: Role of the family physician in the process of traumatic disease treatment is especially important and lies in the organization of medical treatment and nutrition of patients on an ambulatory stage.

Keywords: Obesity; Polytrauma; Treatment; Nutrition

Introduction

Obesity rates have continued to increase recently, what is connected to the reduction of physical activity of population [1]. Specific physiological processes of obesity form the basis for more severe injuries as a result of sustained traumas, as well as a high degree of risk of complications development, often even fatal outcomes [2]. Such peculiarities of the organism in case of high body mass index (BMI) directly influence the organization

of medical provision, form specific technical manoeuvres in the tract of surgical interventions, and require specific post-surgery care, rehabilitation, both during the hospital stage as well as after discharge from the in-patient department [3-5].

Patients who suffer from obesity take a special place among injured, what complicates the course of traumatic disease on its different stages [6]. Mostly phenomena of tissue hypoxia and ischemia, caused by inconsistency of oxygen supply and

its consumption appear in this group of patients, what calls for respiratory support. Oxygen supply decreases by means of concomitant pathologies, verified almost in all the patients of this group, namely reduction of the cardiac output associated with chronic cardiac insufficiency, atherosclerosis, and chronic obstructive pulmonary disease. Taking into account the above-mentioned, it should be considered that such patients are significantly important for diagnostics and treatment of acute thoracic and abdominal trauma, what in its turn requires special approach in the selection of disease management as well as medical support of family physicians on an outpatient basis.

The Aim

To determine the peculiarities of treatment and nutrition of obese patients who suffered from Polytrauma.

Materials and Methods

Clinical material composed of 67 patients who sustained severe concomitant body trauma. The age of patients was 18 - 68 years (mean and median - $46,9 \pm 1,3$ year). Among them - 41 (61,2%) men, 26 (38,8%) women, 47 (70,1%) persons of working age. Patients had traumas of variable localisation and severity.

The patients were divided into three clinical groups respectively to the BMI meaning. The first group consisted of 18 (26,9%) patients with normal body mass ($BMI \geq 24,9$ kg/m²), the second- 28 (41,8%) patients, which are overweight and have I-st obesity degree, ($BMI = 26,2 - 34,2$ kg/m²) and the third consisting of 21 (31,3%) injured with II-III obesity degree. ($BMI = 35,3 - 41,9$ kg/m²).

All the patients underwent diagnostics and treatment of the concomitant body trauma according to the generally accepted and local protocol on the hospital stage. After discharge from the in-patient department, patients were directed for case follow-up by a family physician.

Results

On the grounds of the long-term outcomes assessment cards developed by us, treatment of the severe concomitant trauma in persons with obesity, we found typical complications of the traumatic disease. These cards contained by system analysis of

consequences of the sustained polytrauma on the systems and organs respectively to the BMI meaning. Patients of the III clinical group were the most difficult for treatment in the practice, needed special nutrition as they had more complications developing, which required appropriate medical support. Therefore, family physicians verified pneumonia of variable localisation in 18 (85,7%; $p < 0,02$) patients, who sustained closed chest injury, diagnosed with respiratory distress syndrome in the in-patient department. The appearance of such changes was associated with the influence of metabolites of damaged cells, inflammation products, proteins, and other biologically active agents, which get into lungs by the venous system, where their specific pathological activity is realized on alveolar-capillary membrane [7,8]. The main criteria were presence of periodical cough with insignificant sputum production, bubbling rales were heard auscultatively, in lower parts of lungs as a rule.

Treatment and nutrition of such patients on an ambulatory basis is a real challenge for a family physician. Firstly, these are peculiarities of care, as obesity is caused by sedentary lifestyle, and presence of the sustained severe, often skeletal, trauma, which makes early active mobilization of the patient impossible, often complicates lung pathology treatment. It is impossible to transport such patients to polyclinic department or family outpatient department, and therefore, to prescribe additional instrumental examination methods, such as chest X-ray examination, ultrasound examination of internal organs.

The other difficulties family physicians faced in the process of medical care provision were stipulated by the selection of the method of administration and adequate dosage of medication. It is necessary to indicate that it is inappropriate to apply intramuscular injection for patients with obesity, as their subcutaneous tissue is so expressed, that it was impossible to reach the muscle with a needle almost in 100% events ($p < 0,01$). Therefore, medication should be prescribed in the form of tablets, and in the event, when this is not enough, it is necessary to conduct catheterization of peripheral vein for further drop or bolus medication administration.

In general, treatment of such patients was complex and included applying of the diet therapy (a low-calorie diet with enough protein, vitamins and low levels of animal fats and carbohydrates, especially easily digestible), pharmacological therapy (antibiotics,

mucolytics, solvents) as well as therapeutic exercise, which played almost dominant role. In particular, therapeutic massage was prescribed for improvement of general body tone, activation of peripheral circulation and lymph flow, oxidation-reduction and metabolic processes, retroaction to the impaired motor-evacuation function of the large intestine, eliminating fatigue and increasing muscle tone and functioning.

9 (42,9%) of the III clinical group were diagnosed with thromboembolism of small pulmonary arteries on an ambulatory basis by family physicians. Such complication was associated with both trauma presence and obesity, which could be stipulated by the creation of specific prothrombotic factors of adipose tissue, as well as thrombocyte dysfunctions. This was a consequence of post-traumatic deep venous thrombosis and risk of stroke or acute myocardial infarction. Therefore, all the patients with concomitant body trauma, especially suffering from obesity, should continue prophylactics of a thromboembolic complication of concomitant body injury after discharge from the in-patient department.

The other, equally important issue, family physicians faced, is the problem of nutritional support of patients. Nutrition of patients of the I st clinical group was conducted according to the generally-accepted standards via a combination of a balanced diet. Patients with outcomes of the sustained craniocerebral injury with the deglutitive problem were administered food via nasogastric tube.

Patients with obesity were added balanced mixes for enteral nutrition to the ration, what is related to the necessity of constant stimulation of stomach and bowel motor activity. We admitted late paresis of the gastrointestinal tract in 29 (43,3%; $p < 0,03$) patients (II-III clinical groups) and interpreted them as a result of intra-abdominal hypertension because of intra-abdominal fat present in this group of patients.

The other late complication in 37 (55,2%; $p > 0,02$) patients of II and III clinical groups were decubitus in the tail bone area, and 12 (17,9%; III clinical group) were diagnosed with suture sinuses in the areas of post-surgery wound of variable localisation. In such cases, family physicians engaged surgeons to the treatment process, as they gave recommendations concerning topical treatment, which mostly was in applying salve dressings.

Summing up the above-mentioned, we want to draw the attention of the medical community to obesity, as not only social but directly medical problem, as a share of people, suffering from it, increases recently [5,9]. Such patients require special differential approach, as overweight creates additional difficulties in both diagnostic-treatment process and medical care. Consideration of appearance of the above-mentioned difficulties of such patients on the obesity background, improvement of skills of adequate complex medication support, rational diets allows us to form the basis for the creation of a better diagnostic and treatment strategy, and, thus, to improve results and long-term outcomes during care provision to patients with polytraumas.

Discussion

Treatment of the patients with outcomes of the sustained trauma on the obesity background is quite a serious challenge for a family physician. Firstly, this is stipulated by complications of different nature within injured anatomical parts of the body, as well as peculiarities of care for such patients, what directly influences the quality of the treatment process on hospital and ambulatory stages, according to its duration. According to the data provided by Jung-Fang Chuang, *et al.* (Thailand, 2016), the term of treatment of patients with concomitant body trauma on the background of obesity is approximately 30% longer compared to patients with normal body mass [4,9]. High frequency of respiratory complications, frequent thromboembolism of small pulmonary arteries and different infectious components of wound surfaces are distinguished among the reasons for such phenomena [10]. Severe traumatic disease in patients with high BMI ($35,0 \text{ kg/m}^2$) is also associated with concomitant chronic pathology. Obesity causes anatomical and physiological changes in the form of endocrinological, electrolyte, hematological and metabolic abnormalities, which prevent body reaction to trauma as well as form basis for the frequent appearance of complications [8,10].

It should be noted that the results of our study correspond the data of world scientific literature concerning the description of early and long-term complications in different periods of traumatic disease among patients with polytrauma on the obesity background. Presented data correlates with data given by the other authors [1,9], who emphasize attention of the medical community

to the problem of treatment process organization for patients with obesity, determined challenges for family physicians [11], as the leading link in the final stage of the treatment of traumatic disease.

Conclusions

Role of the family physician in the process of traumatic disease treatment is especially important and lies in the organization of treatment and medical nutrition of patients on an ambulatory stage.

Bibliography

1. Marina I., *et al.* "The influence of parenteral glutamine supplementation on glucose homeostasis in critically ill polytrauma patients - A randomized-controlled clinical study". *Journal of Clinical Nutrition* 34.3 (2015): 377-382.
2. Wagner ER., *et al.* "Effect of Body Mass Index on Complications and Reoperations After Total Hip Arthroplasty". *Journal of Bone and Joint Surgery* 98.3 (2016): 169-179.
3. Mica L., *et al.* "The impact of body mass index on the development of systemic inflammatory response syndrome and sepsis in patients with polytrauma". *Journal of Injury* 45.1 (2014): 253-258.
4. Chuang JF., *et al.* "Obese patients who fall have less injury severity but a longer hospital stay than normal-weight patients". *World Journal of Emergency Surgery* 11 (2016): 11-14.
5. Weinklein JC., *et al.* "Morbid Obesity Increases the Risk for Systemic Complications in Patients With Femoral Shaft Fractures". *Journal of Orthopaedic Trauma* 29.3 (2015): 91-95.
6. Neville A., *et al.* "Obesity is an independent risk factor for mortality in severely injured blunt trauma patients". *Archives Surgery* 139 (2004): 983-987.
7. Byrnes MC., *et al.* "The effect of obesity on outcomes among injured patients". *Journal of Trauma* 58 (2005): 232-237.
8. Schemitsch EH., *et al.* "Prognostic factors for predicting outcomes after intramedullary nailing of the tibia". *Journal of Bone and Joint Surgery* 94 (2012): 1786-1793.
9. Doak C M., *et al.* "Age standardization in mapping adult overweight and obesity trends in the WHO European". *Obesity Reviews* 13 (2012): 174-191.
10. Licht H., *et al.* "The Relationship of Obesity to Increasing Health-Care Burden in the Setting of Orthopaedic Polytrauma". *Journal of Bone and Joint Surgery* 18 (2015): 73-81.
11. Khimich S and Chemerys O. "Role of the Family Physician in the Treatment of Patients with Polytrauma on the Obesity Background on an Ambulatory Stage". *Wiadomosci Lekarskie* LXXII.4 (2019): 631-634.