

Therapy

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PECULIARITIES OF EATING BEHAVIOUR IN PATIENTS WITH OVERWEIGHT, OBESITY AND CHOLELITHIASIS

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Obesity and cholelithiasis in Ukraine are the most important health care problems. According to the World Health Organization, as of 2022, 58.4% of Ukrainians over the age of 18 are overweight, and 25.0% suffer from obesity, with 15.0–20.0% of the population having cholelithiasis. All these diseases have common etiological factors of occurrence, such as disorders of healthy eating behaviour (EB), hormonal changes, and disorders of gallbladder motility. The purpose of the research was to find the peculiarities of EB in patients with cholelithiasis on the background of abdominal obesity and establish correlations between these diseases. 180 examined were divided into 3 groups: the 1st group consisted of 60 people with cholelithiasis and overweight, with an average Body Mass Index (BMI) of (26.7 ± 0.31) kg/m²; the 2nd group consisted of 60 people with cholelithiasis and abdominal obesity, with an average BMI of (32.15 ± 1.13) kg/m². The 3rd (control) group consisted of 60 healthy people with an average BMI of (21.0 ± 1.43) kg/m². To determine eating disorders, questionnaires were conducted according to the DEBQ (Dutch Eating Behaviour Questionnaire). In patients of the 1st group, the healthy type of EB was recorded 5.8 times ($\chi^2=4.26$, $p=0.04$) less often than among the 3rd group, while the restrained type of EB was recorded 5.25 times ($\chi^2=5.2$, $p=0.002$) more often than in the 3rd (control) group; the external type recorded 2.95 times ($\chi^2=9.2$, $p=0.023$) more often than in the 3rd (control) group. In patients of the 2nd group, the healthy type of EB was recorded 8.18 times ($\chi^2=5.56$, $p=0.021$) less often than among the 3rd (control) group, the restrained type of EB was recorded 5.68 times ($\chi^2=6.32$, $p=0.031$) more often than in patients of 3rd (control) group; was also the external type recorded 3.24 times ($\chi^2=3.01$, $p=0.001$) more often than in the 3rd (control) group. In obese individuals, a strong correlation was established between BMI and restrained type of EB ($r=0.71$, $p=0.02$), external type of EB ($r=0.70$, $p=0.003$).

Keywords: *disorder of food behavior, healthy type, external type, restrained type, body mass index.*



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Introduction

Obesity in Ukraine is one of the most important health care problems. According to estimates made back in 2012, 53.0% of Ukrainian residents were overweight, and about 20.0% of them were obese, and their number is constantly growing [1]. As of 2022, according to the World Health Organization, 58.4% of Ukrainians over the age of 18 were overweight, and 25.0% suffered from obesity [2; 3]. The increase in the number of people with obesity is associated with both irrational nutrition and hypo dynamism, as well as constant psychological stress, disruption of the nervous and endocrine systems. This trend is consistent with global trends in the prevalence of obesity, where the most developed industrialized countries of the world occupy the first places, such as the USA, Great Britain, Hungary, China and a number of other European countries. There is also an increase in the prevalence of obesity in other regions of the world, both among adults and among children [4–6]. Obesity is a serious disease that affects human life and health, leading to cardiovascular diseases (stroke, heart attack, hypertension, atherosclerosis); diseases of the respiratory system; disorders of the endocrine system (diabetes, hormonal failures in the work of the gonads); diseases of the digestive organs (gallstone disease, cholecystitis); deterioration of the musculoskeletal system (impaired blood circulation, weakened muscles, arthritis); violation of reproductive function; and an increased risk of cancer.

Obesity increases the risk of gallbladder disease and is a leading factor in the development of gallstone disease. All these diseases have common etiological

factors of occurrence: violation of healthy eating behavior. Cholelithiasis is most common in people of the white race in countries with a Western lifestyle (USA, Europe) – up to 15.0–20.0% of the population, whereas in Africa, Asia and Japan – 3.0–5.0% [9]. Most often, clinical manifestations of cholelithiasis are diagnosed in people aged 40–69 years, and in women 2–3 times more often than in men [10; 11]. The incidence increases with age, reaching 30.0% in the elderly. In recent decades, the frequency of development of gallstone disease in children and adolescents has been increased as well as obesity [12]. A systematic review of 17 prospective studies involving 1,921,103 participants found a two-fold increased risk of gallbladder disease in patients with a Body Mass Index (BMI) greater than 25 kg/m². The study has proven that overweight and obesity lead to changes in the chemical composition of bile, increase the viscosity of bile due to its oversaturation with cholesterol, reduce the motility of the gallbladder and biliary tract and, as a result, increase the risk of stone formation in the gallbladder and bile ducts [13].

Hormonal changes, gallbladder motility disorders, and eating disorders are the main mechanisms that explain the link between obesity and cholelithiasis [14; 15]. To date, there is little scientific data on the characteristics of gallbladder disease in patients with abdominal obesity, so the research topic has great medical and social importance. Knowledge of the characteristics of eating behavior in patients with cholelithiasis on the background of abdominal obesity will help to develop effective medical and preventive care for this category of the population, reduce

complications, and prevent recurrence of the above-mentioned diseases.

The purpose of the research was to find the peculiarities of eating behavior in patients with cholelithiasis housing on the background of abdominal obesity and establish correlations between both diseases.

Materials and Methods

This study was a model of an open prospective cohort study. 180 participants (90 men and 90 women) receiving outpatient treatment at the University Polyclinic of the Petro Mohyla National University during 2022–2023 were included in the study. The age of the patients ranged from 20 to 70 years, with an average age of (45 ± 1.55) years. All examined were divided into three groups: 1st group consisted of 60 people (30 women and 30 men) with cholelithiasis (stage of chronic calculous cholecystitis) and overweight with BMI from 25.0 kg/m^2 to 28.4 kg/m^2 (average [26.7 ± 0.31] kg/m^2); 2nd group – 60 people (30 women and 30 men) with cholelithiasis and abdominal obesity with BMI ranging from 30.5 kg/m^2 to 33.8 kg/m^2 (average BMI of [32.15 ± 1.13] kg/m^2). The 3rd (control) group consisted of 60 people (30 women and 30 men) with normal weight, with a BMI ranging from 18.5 kg/m^2 to 23.5 kg/m^2 (average BMI of [21.0 ± 1.43] kg/m^2).

The criteria for inclusion in the study were patients with chronic calculous cholecystitis according to ultrasound and BMI more than 25.0 kg/m^2 . The study did not include patients taking hormonal drugs or those with hereditary obesity and multiple organ failure.

The patients underwent general clinical, laboratory and instrumental research methods, which although were not the purpose of the study, but must be taken into account for assessing the severity of the patient's condition, risk assessment and for further treatment planning.

To determine Eating Behaviour (EB) disorders, questionnaires were conducted

according to the Dutch Eating Behavior Questionnaire (DEBQ). The questionnaire helps to identify pathological types of EB: restrained, emotional and external. The questionnaire consists of 33 questions, each of which has 5 answer options: "never", "rarely", "sometimes", "often" and "very often", which are subsequently rated on a scale from 1 to 5, except for the 31st a point that has opposite values. To calculate the points for each scale, the values of the answers to each item were added up and the resulting sum was divided by the number of questions on the given scale. Questions 1–10 represent a scale of restrictive eating behavior, which is characterized by deliberate efforts to achieve or maintain a desired weight through self-restraint. Questions 11–23 are a scale of emotional eating behavior, according to which the desire to eat arises in response to various emotional states. Questions 24–33 are an external eating behavior scale, in which the desire to eat is stimulated not by the actual feeling of hunger, but by the appearance of food, its smell, texture, or the sight of other people taking the food. The average indicators of restrictive, emotional and external eating behavior for people with a normal weight are 2.4, 1.8 and 2.7 points, respectively. If one of the scales scored more than the average value, then a disorder in eating behavior was diagnosed.

The study was approved by the Commission on ethics and bioethics of Medical Institute of the Petro Mohyla Black Sea National University. The study was conducted in accordance with the basic bioethical norms of the Helsinki Declaration of the World Medical Association on Ethical Principles of Scientific and Medical Research, as amended (2000, amended in 2008), the Universal Declaration on Bioethics and Human Rights (1997), the Council of Europe Convention on Human Rights and Biomedicine (1997). All participants were informed about the aims,

organization, methods of the study and signed an informed consent to participate in it, and all measures were taken to ensure patient anonymity.

Statistical processing of the research results was carried out by the methods of variational statistics implemented by the standard package of application programs SPSS 13.0 for Windows (USA). Under the conditions of normal distribution, quantitative indicators were displayed in the form of mean (M) and standard deviation (S). Discrete values are presented in the form of absolute and relative frequencies (percentage of observation to the total number of examined). Pearson's chi-squared test (χ^2) was used to compare the distribution of shares of two variables. The difference was considered significant if the achieved significance level (p) was lower than 0.05. The obtained results were considered statistically significant at $p < 0.05$. The relationship between indicators of the quantitative scale was evaluated using the Spearman correlation coefficient (r). The strength of the relationship was interpreted as follows: very weak – 0–0.3; weak – 0.3–0.5; medium strength – 0.5–0.7; strong – 0.7–0.9; very strong – 0.9–1.0.

Results and Discussion

Although general clinical and laboratory methods were not the purpose of the study, they were conducted to assess the severity of the patients' condition. These methods recorded pronounced leukocytosis with a shift of the leukocyte formula to the left, an increase in the erythrocyte sedimentation rate (ESR), hypercholesterolemia, hyperbilirubinemia due to the predominance of the direct fraction, an increase in alkaline phosphate, which made it possible to assert the presence of stagnation and a long-term violation of bile outflow, which, according to the authors, caused not only by the general systemic inflammatory reaction of the body, but also by disturbances of lipid metabolism in patients of the 1st and 2nd compared to the 3rd group.

The results of the study established that in patients of the 3rd (control) group: a healthy type of EB was recorded in 44 (72.0%) patients, a restrained type of EB – 4 (8.0%), an emotional type of EB – 5 (8.6%), an external type of EB – 7 (11.4%). The structure of the distribution of types of EB in patients of the 1st group was as follows: the healthy type of EB was recorded in 8 (12.4%) patients, the restrained type of EB – in 25 (42.0%), the emotional type of EB – 7 (12.0%), the external type EB – in 20 (33.6%). In patients of 2nd group, a healthy type of EB was recorded in 5 (8.8%) patients, a restrained type of EB – in 25 (45.4%), an emotional type of EB – in 5 (8.9%), external type of EB – in 22 (36.9%). Thus, as the weight of patients increased, the number of people with healthy EB decreased, and the number of pathological types of EB increased, due to restrictive and external types (*Fig. 1*).

In patients of the 1st group, the healthy type of EB was recorded 5.8 times ($\chi^2=4.26$, $p=0.04$) less often than among the 3rd (control) group, while the restrained type of EB was recorded in 5.25 times ($\chi^2=5.2$, $p=0.002$) more often than in patients of the 3rd (control) group; external type, was also recorded 2.95 times ($\chi^2=9.2$, $p=0.023$) more often than in the 3rd (control) group.

In the 2nd group, a similar trend was observed, as the weight of patients increased, the number of pathological types of EB increased. In patients of the 2nd group, the healthy type of EB was recorded 8.18 times ($\chi^2=5.56$, $p=0.021$) less often than among the patients of the 3rd (control) group, while the restrained type of EB was recorded 5.68 times ($\chi^2=6.32$, $p=0.031$) more often than in patients of the 3rd (control) group; external type was also recorded 3.24 times ($\chi^2=3.01$, $p=0.001$) more often than in the 3rd (control) group (*Table 1*). There were no significant differences in EB between the 1st and 2nd groups ($p > 0.05$).

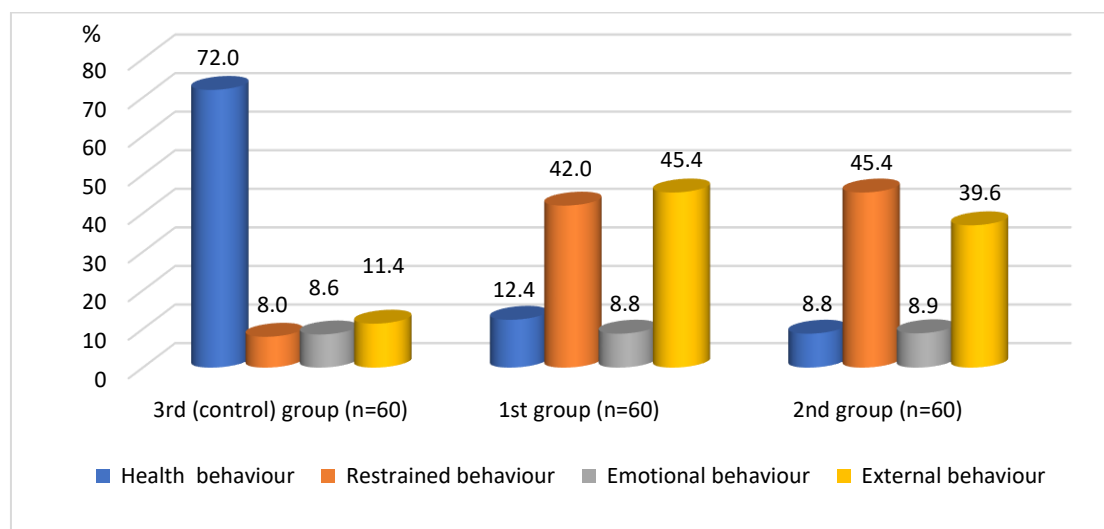


Fig.1. Types of eating behaviour in patients of different clinical groups.

Table 1. Types of eating behavior in patients of different clinical groups depending on BMI (kg/m²)

Type of eating behavior (EB)	3 rd (control) group (n=60)		1 st group (n=60)		EB differences between 3 rd and 1 st groups		2 nd group, (n=60)		EB differences between 3 rd and 2 nd groups		EB differences between 1 st and 2 nd groups	
	n	%	n	%	χ ²	p	n	%	χ ²	p	χ ²	p
Health	44	72.0	8	12.4	4.26	0.04*	5	8.8	5.56	0.021*	10.8	0.37
Restrained	4	8.0	25	42.0	5.21	0.002*	28	45.4	6.32	0.031*	11.4	0.76
Emotional	5	8.6	7	12.0	8.3	0.13	5	8.9	7.98	0.04*	12.1	1.00
External	7	11.4	20	33.6	9.2	0.023*	22	36.9	3.01	0.001*	10.6	0.87

Notes: * – the difference is probable in comparison with the control group (p<0.05).

According to the correlation analysis, a correlation was established in the 1st group between BMI and restrained type of EB (r=0.59, p=0.03), external type of EB (r=0.60, p=0.001). In the 2nd group, a strong correlation was established between BMI and restrained type of EB (r=0.71, p=0.02),

external type of EB (r=0.70, p=0.003). In the 3rd (control) group, a strong correlation was established between BMI and healthy EB (r=0.89, p=0.04), (Table 2). Thus, it can be argued that there is a direct correlation between BMI and the type of EB.

Table 2. Correlation between BMI (kg/m²) of patients and types of eating behaviour of patients

Type of eating behavior (EB)	Groups					
	1 st (n=60)		2 nd (n=60)		3 rd (control) (n=60)	
	r	p	r	p	r	p
Health	0.1	0.14	0.2	0.14	0.89	0.04*
Emotional	0.3	0.23	0.4	0.12	0.45	0.09
External	0.60	0.001*	0.71	0.02*	0.3	0.07
Restrained	0.59	0.03*	0.70	0.03*	0.52	0.06

Notes: * – the difference is probable at p<0.05. Bond strength: very weak – 0–0.3; weak – 0.3–0.5; medium strength – 0.5–0.7; strong – 0.7–0.9; very strong – 0.9–1.0.

In our opinion, eating disorders are the main factors in stone formation in gallbladder and ducts. These disorders could be realized in the form of irrational eating, strict diets that alternate with periods of overeating that are characteristic of the restrained type; or frequent abuse of fatty and fried food, eating with company, eating large volumes of food, when the stimulus to eat is not the physical feeling of hunger, but also the sight and smell of food, a covered table and others. That's why, education patients healthy eating skills and modifying pathological types of eating behavior is one of the main elements not only for optimizing the body mass index, but also an effective means of preventing the formation of stones in the gallbladder and bile ducts.

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Conclusions

Stone formation, overweight and obesity are interrelated and mutually influencing pathologies. The study found that in patients with cholelithiasis whose BMI is more than 25 kg/m², eating disorders of the external and restrictive types are in two and five times more common, respectively, than in patients with a normal body mass. Therefore, weight loss and the acquisition of healthy eating habits should be the initial treatment for such patients.

Prospects of the Research

The results of the study provide the basis for further development and practical implementation of an individual program for rational nutrition in patients with cholelithiasis and obesity.

Conflict of interest is absent.

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ОСОБЛИВОСТІ ХАРЧОВОЇ ПОВЕДІНКИ У ПАЦІЄНТІВ З НАДЛИШКОВОЮ ВАГОЮ, ОЖИРІННЯМ ТА ЖОВЧНОКАМ'ЯНОЮ ХВОРОБОЮ

Ожиріння та жовчнокам'яна хвороба (ЖКХ) в Україні є одними із найактуальніших проблем охорони здоров'я. Станом на 2022 рік, за даними ВООЗ, 58,4 % українців старше 18 років мають зайву вагу, а 25,0 % страждають на ожиріння, 15,0–20,0 % – на ЖКХ. Всі ці нозології мають спільні етіологічні фактори виникнення, а саме порушення здорової харчової поведінки, гормональні зміни, порушення моторики жовчного міхура та ін. Метою дослідження було з'ясувати особливості харчової поведінки (ХП) у пацієнтів з ЖКХ на фоні абдомінального ожиріння, встановити кореляційні зв'язки між обома нозологіями. Було обстежено 180 пацієнтів. Всі обстежені були розподілені на 3 групи: до 1-ї групи увійшло 60 осіб з ЖКХ на фоні надлишкової ваги з індексом маси тіла $IMT_{cp.}=(26,7\pm 0,31)$ кг/м²; до 2-ї – 60 осіб з ЖКХ та абдомінальним ожирінням з $IMT_{cp.}=(32,15\pm 1,13)$ кг/м². 3-ю групу склали 60 осіб з $IMT_{cp.}=(21,0\pm 1,43)$ кг/м². Для визначення розладів ХП проводили анкетування за опитувальником Dutch Eating Behaviour Questionnaire (DEBQ). У пацієнтів 1-ї групи, здоровий тип ХП був зафіксований у 5,8 разів ($\chi^2=4,26$; $p=0,04$) рідше, ніж серед обстежених 3-ї (контрольної) групи, у той час як обмежувальний тип ХП фіксували у 5,25 рази ($\chi^2=5,2$; $p=0,002$) частіше, ніж у пацієнтів 3-ї (контрольної) групи; екстернальний тип, також був зафіксований у 2,95 рази ($\chi^2=9,2$; $p=0,023$) частіше, ніж у 3-ї (контрольній) групі. У пацієнтів 2-ї групи, здоровий тип ХП був зафіксований у 8,18 разів ($\chi^2=5,56$, $p=0,021$) рідше, ніж серед обстежених 3-ї (контрольної) групи, обмежувальний тип ХП фіксували у 5,68 рази ($\chi^2=6,32$; $p=0,031$) частіше, ніж у пацієнтів 3-ї (контрольної) групи; екстернальний тип, також був зафіксований у 3,24 рази ($\chi^2=3,01$; $p=0,001$) частіше, ніж у 3-ї (контрольній) групі. У осіб з ожирінням сильний кореляційний зв'язок був встановлений між ІМТ та обмежувальним типом ХП ($r=0,71$; $p=0,02$), екстернальним типом ХП ($r=0,70$; $p=0,003$).

Ключові слова: розлади харчування, здоровий тип, екстернальний тип, обмежувальний тип, індекс маси тіла.

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