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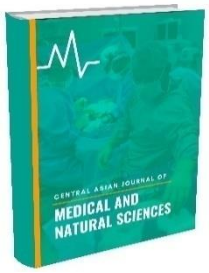

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Impact of Endocrine Disorders on the Results of Surgical Treatment of Patients with Cholelithiasis of Elderly and Old Age

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Abstract: The number of patients with cholelithiasis and endocrine pathology increases in old age and old age. Age of the patient over 60 years is one of the risk factors of complications after cholecystectomy. In old age the number of patients with cholelithiasis and endocrine pathology increases. The patient's age over 60 years is one of the risk factors of complications after cholecystectomy.

Key words: cholelithiasis, endocrine disorders, advanced age and old age.

Introduction: Biliary stone disease (BCD) is diagnosed in 10-20% of adults in economically developed countries. Endocrine diseases (ED) and metabolic disorders play an important role in the occurrence of gallstones [1, 4]. In the older age group the number of persons with both cholerithiasis and endocrine pathology is increasing [8]. Therefore, a number of elderly and senile patients are simultaneously diagnosed with cholelithiasis and EH. Surgical method is considered to be the leading one in treatment of patients with cholelithiasis [9]. Despite the widespread introduction of minimally invasive techniques and improved preoperative preparation, the age of the patient over 60 years remains a risk factor for postoperative complications (POC). Complications occur in 5-24% of patients operated on for GI in old age and old age, and postoperative mortality in the older age group reaches 0.48-0.7% [5, 9]. However, the influence of ez and metabolic disorders on the course of perioperative period in persons over 60 years of age with cholelithiasis is insufficiently studied.

Purpose of the study – To investigate the influence of endocrine pathology on the immediate results of surgical treatment of GI patients in old age and old age.

Material and methods of research: From 2015 to 2021, 295 patients with cholelithiasis were operated on in the Department of Abdominal Surgery. There were 206 (69.8%) women and 89 (30.2%) men. GSD was diagnosed based on the results of physical, laboratory and ultrasound examinations. After the operation a histological study of the removed gallbladder (BP) was performed. In addition, screening for metabolic syndrome (MS), thyroid pathology, calcium metabolism disorders and adrenal gland diseases was performed.

MS was approved according to the International Diabetes Federation recommendations of 2005 [3]. Anthropometry was performed, waist circumference (WC) was measured, and body mass index (BMI) was calculated. Obesity was diagnosed if BMI exceeded 30 kg/m2, and abdominal obesity (AO) was diagnosed if BMI was over 80 cm in women and over 94 cm in men.

Biochemical parameters of blood serum, serum lipids were studied using Dixion Torus 1220 analyzer (Russia). Thyroid gland (TSH) and free thyroxine (cT4) levels were studied using Cobas 6000 analyzer ("Roche", Switzerland). The euthyroid condition was diagnosed with TSH concentration from 0.27 to 4.2 μMO/ml, cT4 - 0.93-1.7 ng/dL. Ultrasonography of abdominal organs and endocrine system was performed using Mindray DC-80 (China) with 3.5-10.0 MHz transducer.

According to age, patients with cholelithiasis were divided into two groups. The main group included 107 (36,3%) patients over 60 years old, the control group included 188 (63,7%) patients under 60 years old.

The results were calculated using the SPSS 11.5 for Windows statistical program. The Kolmogorov-Smirnov test was used to test the hypothesis of normal distribution. In case of normal distribution of variation series we determined arithmetic mean (M) and standard deviation of arithmetic mean (SD), if data did not follow normal distribution we determined minimal (min) and maximal (max) value and calculated median (Me). The relationship between the values was studied using Spearman rank correlation and determining the correlation coefficient (r). The critical level of significance (p) for testing statistical hypotheses was taken to be 0.05.

Results and discussion. Routinely 63 (58,9%) elderly and elderly patients and 139 (73,9%) younger patients were hospitalized, on an emergency basis - 44 (41,1%) and 49 (26,1%) patients (c2=7,162; p=0,007). First-time GID was detected in 22 (20.6%) and 20 (10.6%) patients, respectively (c2=5.498; p=0.019).

There were 66 (61.7%) women and 41 (38.3%) men in the main group and 140 (74.5%) women and 48 (25.5%) men in the control group (c2=5.291; p=0.021). Obesity (BMI≥30 kg/m2) was confirmed in 37 (34.6%) patients over 60 years of age and in 80 (42.6%) patients under 60 years of age (c2=1.812; p=0.178), AR in 92 (86.0%) and in 145 (77.1%) subjects (c2=3.384; p=0.066). Chronic calculous cholecystitis was diagnosed in 73 (68,2%) main group patients and in 138 (73,4%) control patients, dropsy of LP - in two (1,9%) and two (1,1%) patients, acute calculous cholecystitis - in 32 (29,9%) and 48 (25,5%) patients (c2=1,063; p=0,588). Choledocholithiasis was diagnosed in 14 (13.1%) and seven (3.7%) patients, respectively (c2=9.037; p=0.003).

Patients with accompanying somatic diseases received preoperative preparation on an outpatient basis, in a therapeutic or surgical hospital. In patients with choledocholithiasis the treatment was performed in two stages: first endoscopic transpapillary intervention with lithoextraction and then cholecystectomy (CE). Time from admission to the surgical department to CE in patients over 60 years old was 1-13 (Me=2.0) days, in patients under 60 - 1-25 (Me=1.0) days (p=0.007).

All surgeries were performed using multicomponent combined endotracheal anesthesia. Laparoscopic CE was performed in 74 (69.2%) patients of the main group and in 171 (91.0%) patients of the control group; open (including conversion) CE was performed in 33 (30.8%) and in 17 (9.0%) patients (c2=23.019; p<0.001). Xe lasted 40-225 (Me=75) minutes and 30-205 (Me=65) minutes, respectively (p=0.005).

At histological examination chronic cholecystitis was confirmed in 75 (70,1%) elderly and elderly patients and in 140 (74,5%) younger patients catarrhal cholecystitis - in five (2,7%) patients of the control group, phlegmonic cholecystitis - in 14 (13,1%) and in 34 (18,1%) persons, gangrenous

cholecystitis - in 18 (16,8%) and in nine (4,8%) patients (c2=14,864 p=0,002). A positive correlation was found between the patient's age and severity of GI inflammation (r=0,176; p=0,002). Correlations between BP destruction and OT value (r=0,239; p=0,013), blood serum glucose values (r=0,218; p=0,024), calcium level (r=-0,450; p<0,001) were determined in patients older than 60 years old. In patients under 60 years of age, we found correlations between GI destructive changes and BMI (r=0,145; p=0,048), OT value (r=0,212; p=0,003), blood glucose concentration (r=0,159; p=0,029).

VEP was detected in 14 (13.1%) patients in the main group and six (3.2%) in the control group (c2=10.559; p=0.001). Purulent inflammatory VEP developed in nine (8.4%) elderly patients and five (2.7%) younger patients (c2=4.990; p=0.025); VEP due to decompensation of somatic pathology in six (5.6%) and one (0.5%) patient, respectively (c2=7.583; p=0.006). One patient of the main group had acute myocardial infarction and suppuration of the postoperative wound after conversion surgery for gangrenous cholecystitis. There were no lethal outcomes.

In those over 60 years of age, we found correlations between the incidence of purulent-inflammatory VEP and TTG levels (r=0.273; p=0.008), hyperglycemia (r=0.211; p=0.029), open/conversion XU (r=0.235; p=0.015). In patients under 60 years of age, correlation between the development of purulent inflammatory VEP and the presence of diabetes mellitus (r=0,158; p=0,030), duration of surgery (r=0,170; p=0,020), severity of GI inflammation (r=0,159; p=0,029) was determined. In the same group of patients, correlations were determined between VEP due to decompensation of somatic pathology and coagulogram disorders (r=0,151; p=0,038).

Patients of the main group were hospitalized for IGD during 3-42 (Me=10,0) days, patients of the control group - 3-38 (Me=8,0) days (p<0,001). In the elderly and senile patients, a correlation was found between treatment time and OT value (r=0.197; p=0.047), TSH value (r=0.304; p=0.010), and serum calcium concentration (r=-0.250; p=0.022). In younger patients, we found correlations between duration of hospital treatment and the presence of EH (r=0.151; p=0.038), metabolic syndrome (r=0.145; p=0.047), and OT value (r=0.188; p=0.010).

So, the clinic of cholelithiasis in patients older than 60 years had a number of peculiarities. There were more men in the older age group (38.3% vs. 25.5%; p=0.021). Correlation between the patient's age and severity of GI inflammation (r=0,176; p=0,002) was determined in the operated patients. Choledocholithiasis was diagnosed in 13.1% of elderly and senile patients and in 3.7% of younger patients (p=0.003).

Endocrine and metabolic disorders (MI, hyperglycemia, diabetes mellitus, hypothyroidism) were significantly more frequently confirmed in patients over 60 years old with GI (81,3% vs. 67,6%; p=0,011). Presence of concomitant pathology and cholelithiasis complications caused increase of preoperative period in elderly and senile patients (Me=2.0 days vs. Me=1.0 days; p=0.007). They were more likely to have open/conversion surgery (30.8% vs. 9.0%; p<0.001). HU in those over 60 years of age lasted longer (Me=75 minutes vs. Me=65 minutes; p=0.005).

Purulent inflammatory VTE (8.4% vs 2.7%; p=0.025) and complications due to decompensation of somatic pathology (5.6% vs 0.5%; p=0.006) occurred more frequently in elderly patients with GSD. Elderly and elderly patients had longer hospital stays (Me=10.0 days vs. Me=8.0 days; p<0.001).

An increase in VOT value in persons older than 60 years is accompanied by an increase in the incidence of destructive cholecystitis (r=0.239; p=0.013) and treatment duration (r=0.197; p=0.047). Abdominal obesity is a major symptom of MS. In abdominal (visceral) adipose tissue a number of biologically active substances are synthesized that lead to metabolic disorders, hyperglycemia, arterial hypertension [3]. In addition, fat infiltration of GI wall in AR patients is detected [10]. These factors

contribute to LV destruction in calculous cholecystitis and create prerequisites for long-term hospital stay of patients with cholelithiasis.

Chronic hyperglycemia in individuals with prediabetes and uncompensated diabetes mellitus causes neutrophilic leukocyte dysfunction, microangiopathy, and worsened blood supply to the GI [4, 7]. The incidence of destructive cholecystitis (r=0.218; p=0.024) and purulent-inflammatory POEs (r=0.218; p=0.024) increases in elderly and elderly patients with elevated glucose concentrations.

Hypothyroidism – is a well-known risk factor for cholelithiasis [1]. In patients with thyroid insufficiency bile properties change, biliary tract motility, microcirculation are disturbed, mucinous edema of tissues occurs, blood clotting and cardiovascular system activity change [2, 8]. Hypothyroidism was diagnosed more frequently (15.9% vs. 5.9%; p=0.016), and the TSH level was significantly higher (E=2.1 μMO/ml vs. E=1.6 μMO/ml; p=0.049) in the elderly group with GID. Lack of thyroid function caused the frequent occurrence of choledocholithiasis, contributed to the development of purulent-inflammatory complications after CE (r=0.273; p=0.008) and led to increased length of hospital treatment in patients over 60 years (r=0.304; p=0.010).

Hypocalcemia - is the body's response to a severe long-term disease [6]. No statistically significant differences in serum calcium concentration (2.29±0.19 mmol/l versus 2.30±0.20 mmol/l; p=0.783) were found in patients of different age groups with cholelithiasis. However, in the elderly and elderly, negative correlations were determined between calcium values and the presence of destructive cholecystitis (r=-0.405; p<0.001) and between calcium levels and duration of hospital treatment (r=-0.250; p=0.022).

Thus, endocrine and metabolic disorders aggravate the course of cholelithiasis in elderly patients, which is accompanied by an increase in the incidence of VTE and length of hospital stay. In the future, we plan to work out an algorithm for the management of patients with cholelithiasis over 60 years old with regard to the functional state of the endocrine system.

Conclusions

1. Endocrine and metabolic disorders were diagnosed in 81.3% of elderly and senile patients with GSD.
2. Cholecystiasis in patients over 60 is more often accompanied by complications (destructive cholecystitis, choledocholithiasis).
3. POC was confirmed in 13.1% of patients operated on for GI at an advanced and old age. The development of purulent inflammatory VOCs in elderly patients was promoted by increased levels of TSH (r=0.273; p=0.008), hyperglycemia (r=0.218; p=0.024) and open/conversion surgery (r=0.235; p=0.015).
4. In patients over 60 years of age with cholelithiasis, there are correlations between the duration of inpatient treatment and OT value (r=0.197; p=0.047), TTG value (r=0.304; p=0.010), and serum calcium concentration (r=-0.250; p=0.022).

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