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SURGICAL TREATMENT OF THE UPPER GASTROINTESTINAL SEGMENT DISEASES IN GERIATRIC PATIENTS

SUMMARY

The aim of the study was to examine specific characteristics of surgical treatment of gastrointestinal segment diseases in geriatric patients. The study involved 73 patients in the study group and 85 patients in the control group. In the study group, 29 patients suffered from chronic heart diseases and 18 from hypertension. The examination revealed that gastric carcinoma was more frequent in elderly patients (23.28%) compared to controls (10.59%). Bleeding gastric ulcer (16.43%), perforated gastric ulcer (12.30%) and perforated duodenal ulcer (12.30%) were the most common pathologic condition of the upper gastrointestinal segment in elderly patients. The most common subsequent postoperative complications in the study group occurred in the cardiovascular (12.50%) and respiratory (2.88%) system. The most frequent surgical complications included: wound infections (25.14%), seroma in the wound (9.67%), and anastomotic dehiscence (5.48%). In the control group, the most frequent postoperative complications were cardiovascular (7.05%), whilst respiratory ones occurred in 1.17%. Surgical complications occurred at the following frequency: seroma in the wound (5.88%), wound infections (4.70%), and anastomotic dehiscence (2.36%). The overall postoperative mortality was higher in the study group (24.6%) compared to the control one (8.23%). Geriatric patients, due to the occurrence of the great number of chronic diseases and frequent postoperative complications, require a carefully planned preoperative treatment and intensive postoperative care.

Keywords: **gastrointestinal segment, elderly patients**

INTRODUCTION

The importance of digestive diseases in the old age is great, since they stand for a significant factor of morbidity and mortality in geriatric patients.

The incidence of various digestive diseases increases with age, not only as a consequence of a series of anatomic and functional changes in the digestive tract that are typical of the old age, but also as a result of a many-year exposure to specific pathogenic factors and noxae concomitant with the aggravation of the defense and immune mechanisms (1).

There are some specific characteristics of geriatric patients that distinguish them from younger and middle-aged ones, as well as certain

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diseases predominant in this age. All this should be considered when planning a surgical procedure.

Common specifics of geriatric patients include: poly-morbidity, relative and absolute ischemia of the vital organs, arterial hypertension, reduced tissue oxygenation, diabetes mellitus, anemia, avitaminosis, and psychic disorders (2).

Key moments in the preparation and surgical treatment of elderly patients include: preoperative treatment, anesthesia, postoperative treatment, and management of possible postoperative complications (2).

AIMS

The aim of this study was to examine specific characteristics of the surgical treatment of the upper gastrointestinal segment diseases in geriatric patients, as well as to point to optimal possibilities for preoperative and postoperative treatment of geriatric patients.

MATERIAL AND METHOD

The study involved a total of 73 patients over 60 years of age, operated on at the Surgical Clinic of the Clinical Center in Niš, in 2003 and 2004, due to the gastrointestinal segment diseases. The study group was divided into three age groups: 1) patients aged 60–65 years; 2) patients aged 66–70 years; and 3) patients over 70 years of age. The control group comprised 85 patients between 20 and 59 years of age who had been operated on at the Surgical Clinic in Niš within the same period due to diseases of the gastrointestinal segment of the digestive tract.

The examination was done as a prospective, highly controlled study, in accordance with a previously designed plan and a questionnaire (general information about the patient; preoperative status of the patient; preoperative diagnosis; intraoperative findings; postoperative complications; and subsequent postoperative mortality).

Data were collected on the basis of the surgical pathology type and classified as follows: distribution of patients according to sex and age; distribution of chronic diseases affecting the course and outcome of the underlying disease; distribution of diseases according to the type of surgical pathology; analysis of performed surgical interventions; analysis of subsequent postoperative complications; and analysis of subsequent postoperative mortality.

The data were PC-processed, and the obtained results were presented in tables and a histogram. The results were tested using the Mantel-Haenzel x^2 Test and Fisher Test of the exact probability.

RESULTS

The examination involved 73 patients in the study group and 85 patients in the control group. Of a total of 73 patients in the study group, 41 (56.16%) were males and 32 (43.84%) were females. In the control group, there were 50 males (58.82%) and 35 females (41.18%). In the study group, the subgroup of 60–65-year-olds comprised 22 patients (30.14%), the 66-70-year-olds subgroup involved 21 patients (28.77%), and the subgroup of patients over 70 included 30 patients (41.09%). In the entire study group, the most frequent surgical interventions on the gastrointestinal segment of the digestive tract were performed for: gastric carcinoma (17 patients – 23.28%), bleeding gastric ulcer (12 patients – 16.43%), perforated duodenal ulcer (9 patients – 12.30%) and mesenteric thrombosis (7 patients – 9.59%). In this group, 6 (8.22%) surgical interventions were performed for bleeding duodenal ulcer, 6 (8.22%) for intestinal rupture, 4 (5.48%) for pyloric stenosis, 2 (2.74%) for hiatal hernia, and 1 (1.37%) for erosive gastritis (table 1a).

The most frequent diseases of the gastrointestinal tract in the control group included: perforated duodenal ulcer (25 patients - 29.41%), pyloric stenosis (15 patients – 17.65%), perforated gastric ulcer (10 patients – 11.76%) and bleeding gastric ulcer (10 patients – 11.76%). In this group, 9 (10.59%) operations were performed for gastric carcinoma, 8 (9.43%) for bleeding duodenal ulcer, 2 (2.35%) for hiatal hernia, 2 (2.35%) for erosive gastritis, 2 (2.35%) for intestinal rupture, and 2 (2.35%) for mesenteric thrombosis (table 1b).

Using the Mantel-Haenzel Test for the presence of ulcerous complications and mesenteric thrombosis, no statistically significant difference in the presence of ulcerous complications was determined between the study group and the control one ($x^2=3.01$; p=NS). However, a statistically significant difference between the two groups occurs with respect to mesenteric thrombosis that was more present in the study group ($x^2=12.7$; $p<0.05$).

The study group was also monitored for the incidence of chronic systemic and organic

Table 1a. Distribution of gastrointestinal pathology in the study group

AGE	60-65		66-70		over 70			
Pathology/Sex	M	F	M	F	M	F	N°	%
Gastric carcinoma	7	2	1	2	2	3	17	23.28
Perforated gastric ulcer	2	3	2	1	1	-	9	12.30
Perforated duodenal ulcer	4	1	-	-	3	-	9	12.30
Bleeding gastric ulcer	-	1	2	7	-	2	12	16.43
Bleeding duodenal ulcer	-	-	-	-	4	2	6	8.22
Pyloric stenosis	2	-	-	-	1	1	4	5.48
Hiatal hernia	-	-	-	2	-	-	2	2.74
Erosive gastritis	-	-	-	1	-	-	1	1.37
Intestinal rupture	-	-	2	-	3	1	6	8.22
Mesenteric thrombosis	-	-	-	1	5	1	7	9.59
Total	15	7	7	14	19	11	73	100.00

Table 1b. Distribution of gastrointestinal pathology in the control group

SEX	M		F			
Pathology	N^{O}	%	N^{O}	%	N^{O}	%
Gastric carcinoma	5	55.55	4	44.45	9	10.59
Perforated gastric ulcer	6	60.00	4	40.00	10	11.76
Perforated duodenal ulcer	16	64.00	9	36.00	25	29.41
Bleeding gastric ulcer	6	60.00	4	40.00	10	11.76
Bleeding duodenal ulcer	4	50.00	4	50.00	8	9.43
Pyloric stenosis	8	53.33	7	46.67	15	17.65
Hiatal hernia	1	50.00	1	50.00	2	2.35
Erosive gastritis	1	50.00	1	50.00	2	2.35
Intestinal rupture	2	100.00	-	-	2	2.35
Mesenteric thrombosis	1	50.00	1	50.00	2	2.35
Total	50		35		85	100.00

diseases that may affect the occurrence of postoperative complications. Cardiac diseases were the most frequent (29 patients – 40.05%), while hypertension occurred in 18 patients (24.30%), anemia in 16 patients (22.37%), and pulmonary diseases in 15 patients (20.99%).

In the control group, no chronic disease was registered (table 2).

Subsequent postoperative complications were monitored and examined in both study and control group. The most common subsequent postoperative complications in the study group occurred in the cardiovascular (12.32%) and respiratory (2.73%) system. The most frequent surgical complications included: wound infections (25.14%), seroma in the wound (9.67%), anastomotic dehiscence (5.48%), and dehiscence due to laparotomy (2.73%) (table 3a).

In the study group, the most frequent postoperative complications occurred in the cardiovascular (7.05%) and respiratory system (1.17%). Surgical complications occurred at the following frequency: seroma in the wound (5.88%), wound infections (4.70%), anastomotic dehiscence (2.36%), and dehiscence due to laparotomy (1.17%) (table 3b).

Table 2. Distribution of the most frequent chronic diseases in the study group

Age	60-65	66-70	over 70	N^O	% total number of patients
Chronic diseases					
Hypertension	5	7	6	18	24.30
Diabetes mellitus	4	3	2	9	12.15
Hypoproteinemia	3	4	7	14	19.33
Anemia	4	4	8	16	22.37
Heart diseases	5	8	16	29	40.05
Pulmonary diseases	3	3	9	15	20.99
Neurological diseases	2	1	2	5	7.18
TBC	1			1	1.10
Chronic nephropathy	2	1		13	4.42

Table 3a. Distribution of postoperative complications in the study group

Age	60-65	66-70	over 70		% total number of patients
Complications				N^O	
Wound infection	4	8	6	18	25.14
Seroma in the wound	3	1	3	7	9.67
Dehiscence due to laparotomy		1	1	2	2.73
Bleeding from the wound	1			1	1.36
Pneumonia			1	1	1.36
Pulmonary failure		1	1	2	2.73
Cardiac complications	1	3	5	9	12.32
Renal failure		1	1	2	2.73
Neurological complications		1	1	2	2.73
Anastomotic dehiscence	1	1	2	4	5.48
Intra-abdominal abscess		1		1	1.36
Total				49	

Table 3b. Distribution of postoperative complications in the control group

Age	M		F			% total number of patients
Complications	N^O	%	N^O	%	N^O	
Wound infection	1	25	3	75	4	4.7
Seroma in the wound	2	40	3	60	5	5.88
Dehiscence due to laparotomy			1	100.0	1	1.17
Bleeding from the wound	1	100.0			1	1.17
Pulmonary failure	1	100.0			1	1.17
Cardiac complications	2	33.33	4	66.67	6	7.05
Renal failure	1	50	1	50	2	2.35
Anastomotic dehiscence	1	50	1	50	2	2.35
Intra-abdominal abscess	1	100.0			1	1.17
Total					23	

Using the Mantel-Haenzel Test for the study of complications frequency (wound infections: x^2=75.37, p<0.01; seroma in the wound: x^2=4.66, p<0.05; dehiscence due to laparotomy: x^2=0.67, p=NS; bleeding from the wound: x^2=0.11, p=NS; cardiac complications: x^2=5.60, p<0.05; anastomotic dehiscence: x^2=11.90, p<0.001; pulmonary complications: x^2=1.39, p=NS; renal complications: x^2=0.67, p=NS), a statistically significant difference between the study and control group was noticed with respect to the occurrence of wound infections, seroma of the wound, anastomotic dehiscence, and cardiac complications, all of them being more frequent in the study group. No statistically significant difference was determined in case of other postoperative complications. In addition, the occurrence of the overall number of co-mplications displays a significant difference between the two groups (x^2=137.50, p<0.001).

The study group and controls were also monitored for subsequent postoperative mortality. Of a total of 73 patients in the study group, 18 (24.60%) died, whist in the control group, out of 85 patients, 7 of them died (8.23%).

Figure 1 shows a mortality ratio between the study and the control group.

Also, the types of surgical procedures which were used in the treatment of gastro-intestinal diseases in the study and control group were examined. Surgical procedures were most commonly performed in the following cases: ulcer perforation (suture of the ulcer – 16); bleeding from the ulcer lesion (ligation of the blood vessel – 16); gastric carcinoma (subtotal gastrectomy – 9).

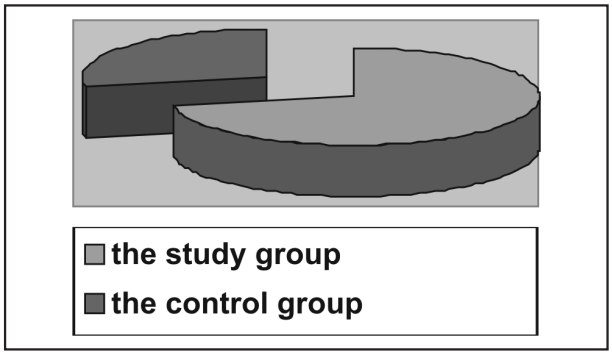

Figure 1. Mortality ratio between the study and control group

In the control group, the most common operations for gastrointestinal pathology included: suture (33) for ulcer perforation; ligation of the blood vessel (10) for hemorrhagic ulcer; subtotal gastrectomy (6) for gastric carcinoma; and resection of the gaster B II (13) for pyloric stenosis.

DISCUSSION

The initial hypothesis was that elderly patients are marked by a specific surgical

Table 4a. Types of operations in gastrointestinal pathology in the study group

Disease	N^O of patients	Type of operation	N^O	%
Perforation of gastric ulcer	9	Suture of the ulcer Suture of the ulcer with GEA Resection of the gaster B II	7 1 1	77.78 11.11 1.11
Perforation of duodenal ulcer	9	Suture of the ulcer	9	100.00
Gastric carcinoma	17	Subtotal resection Total resection GEA	9 1 7	52.94 5.88 41.76
Hemorrhagic gastric ulcer	12	Rupture of the blood vessel Resection of the gaster B II	10 2	83.33 16.67
Hemorrhagic duodenal ulcer	6	Rupture of the blood vessel	6	100.00
Pyloric stenosis	4	Resection of the gaster B II GEA	3 1	75.00 25.00
Hiatal hernia	2	Operation acc. Lortat-Jacob	2	100.00
Intestinal rupture	6	Suture of the intestines	6	100.00
Erosive gastritis	1	Subtotal resection of the gaster	1	100.00
Mesenteric thrombosis	7	Resection of the intestines Explorative laparotomy	1 6	14.28 85.72

Table 4b. Types of operations in gastrointestinal pathology in the control group

Disease	N^{O} of patients	Type of operation	N^{O}	%
Perforation of gastric ulcer	10	Suture of the ulcer Suture of the ulcer with GEA Resection of the gaster B II	8 1 1	80.00 10.00 10.00
Perforation of duodenal ulcer	25	Suture of the ulcer	25	100.00
Gastric carcinoma	9	Subtotal resection Total resection GEA	6 1 2	66.66 11.11 22.23
Bleeding gastric ulcer	10	Rupture of the blood vessel Resection of the gaster B II	8 2	80.00 20.00
Bleeding duodenal ulcer	2	Rupture of the blood vessel	2	100.00
Pyloric stenosis	15	Resection of the gaster B II GEA	13 2	86.66 13.34
Hiatal hernia	2	Operation acc. Lortat-Jacob	2	100.00
Intestinal rupture	8	Suture of the intestines	8	100.00
Erosive gastritis	2	Subtotal resection of the gaster	2	100.00
Mesenteric thrombosis	2	Explorative laparotomy	2	100.00

pathology. Its specific characteristics primarily relate to pathologic conditions which are more frequent in the old age. Concomitant occurrence of more than one disease is the most important feature. Some surgical diseases in the elderly are frequently associated with atypical clinical findings, which is a likely result of the late diagnosis and frequent occurrence of complications. Besides difficulties in establishing a diagnosis in these patients, problems appear in preoperative treatment as well, due to the great number of chronic diseases of the organs and the systems. There are also problems in postoperative treatment of these patients, in particular in managing numerous and diverse postoperative complications.

Peptic ulcer is one of the rare diseases, the symptoms of which diminish with age. However, this disease still remains a significant problem in the pathology of elderly patients, as complications are particularly associated with high mortality (3). Ulcer disease does not occur more often in the old age than it does in middle-aged patients; however, mortality from the complications resulting from ulcer disease increases up to 90%. It has been also demonstrated that duodenal ulcer incidence significantly decreases with the old age, while gastric ulcer incidence increases, thereby changing the ratio from 1:7 to 1:3. The frequency of complications due to ulcer disease (bleeding, perforation) is twice as higher in the old age, while pyloric stenosis is evenly encountered in both elderly and middle-aged patients (4). Irvin (5) describes the factors that contribute to ulcer disease development and increased incidence of complications and mortality such as: previous taking of ulcerogenic drugs, the absence of dispersion in anamnesis, late registration for in-hospital treatment, and shock at the time of admission. Elderly patients usually present with the absence of ulcer disease in anamnesis, negative native graphia of the abdomen (that is, the presence of pneumoperitoneum) and late diagnosis (6). Particularly difficult ulcerous complications in elderly patients include perforation and bleeding. Patients over 70 years of age with ulcer perforation have a markedly higher mortality that increases up to 34% (5). In addition, these patients show a remarkably high incidence of postoperative complications (up to 72%) and high mortality (11.70%) (7, 8). Elderly patients have 6-10-fold increased bleeding from ulcer compared to the young, with bleeding gastric ulcer being more frequent than duodenal one (1). However, in half of the bleeding patients, the anamnesis reveals the presence of ulcerogenic drugs. Bleeding represents not only the most common complication resulting from ulcer disease in the elderly, but is also the most frequent cause of death from peptic ulcer (1,9). By the analysis of the obtained results in the

study group, we registered almost identical incidence of perforation and bleeding as complications resulting from ulcer disease (24.60% and 24.65%, respectively), with bleeding gastric ulcer being the most frequent (16.43%). In the control group, the most frequent complication was perforation of duodenal ulcer (29.41%). In this group, pylorus stenosis was more significant (17.65%) than was in the study group (5.48%). Bleeding gastric ulcer was, therefore, the most frequently occurring complication of ulcer disease in elderly patients, while perforation and pyloric stenosis were the most frequent complications in the middle-aged patients.

A difference was also registered between the study and the control group, with respect to gastric carcinoma incidence. In the study group, gastric carcinoma occurred in 23.28% of the cases. In the middle-aged patients, gastric carcinoma was present in 10.59% of the patients. According to literature data, the highest incidence of gastric carcinoma appears in the sixth decade, whereupon it shows a downward tendency in the seventh and eighth decade of life (10). It is more prevalent in males than females, which has been confirmed in our study.

A significant place in the pathology of elderly patients belongs to mesenteric blood vessel obstructions followed by ischemia and massive intestinal gangrenes, which was registered in 9.59% of elderly patients and only in two cases in younger and middle-aged patients.

By a statistical analysis of the study data, a significant difference was noticed between the two groups with respect to complications (x^2=137.50, p<0.001). In the study group, most frequent were the complications of the surgical wound: infections (25.14%), seroma (9.67%), dehiscence due to laparotomy (2.73%), and bleeding (1.36%). Anastomotic dehiscence was registered in 4 patients (5.48%), complications of the cardiovascular system occurred in 9 patients (12.52%), and pulmonary complications in 2 patients (2.70%). Controls showed a significantly lower incidence of the following postoperative complications: infection of the surgical wound (4.70%), seroma in the surgical wound (5.88%), dehiscence due to laparotomy (1.17%), bleeding from the wound (1.17%), anastomotic dehiscence (2.35%), whereas cardiovascular and respiratory complications were present in 7.05% and 1.17% of cases, respectively. A statistically significant difference in the incidence of the following complications was registered between the study and control group: wound infections (x^2=75.37, p<0.01), seroma in the wound (x^2=4.66, p<0.05), anastomotic dehiscence (x^2=11.90, p<0.001), and cardiovascular complications (x^2=5.60, p<0.05).

One of the reasons for such a high incidence of postoperative complications in elderly patients should be also attributed to diverse chronic diseases in this group of patients. In the examined patients, 670 chronic diseases were registered in the observed period. The most common were diseases of the cardiovascular system (145 patients – 40.05%), hypertension (88 patients – 24.30%), chronic pulmonary diseases (76 patients – 20.99%), anemia (81 patients – 22.37%), hypoproteinemia (70 patients – 19.33%), and diabetes mellitus (44 patients – 12.15%). Subsequent postoperative mortality was higher in elderly patients (24.60%) compared to controls (8.23%) (x^2=43.86, p<0.001).

CONCLUSION

On the basis of the available literature data and the results obtained in this study, the following conclusions can be drawn:

1. There are numerous specific characteristics of surgical pathology and surgical treatment of elderly patients.

2. Bleeding gastric ulcer was a dominant complication of ulcer disease in elderly patients (16.43%).

3. Gastric carcinoma was markedly more frequent in the old age (23.28%) than was in the control group of patients (10.59%).

4. The presence of occlusions of mesenteric blood vessels was statistically more significant in elderly patients compared to controls (9.59% and 2.35%, respectively).

5. Chronic diseases (hypertension, heart and pulmonary diseases, diabetes mellitus, anemia, and hypoproteinemia) occurred in over two thirds of elderly patients.

6. The overall postoperative mortality was higher in the study group (24.60%) compared to the control one (8.23%).

7. Elderly patients, due to the occurrence of a greater number of chronic diseases and frequent postoperative complications, require a planned preoperative treatment and intensive postoperative therapy.

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HIRURŠKA TERAPIJA OBOLJENJA GORNJEG SEGMENTA DIGESTIVNOG TRAKTA KOD GERIJATRIJSKIH BOLESNIKA

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SAŽETAK

Cilj ovog rada bio je da se ispitaju specifičnosti hirurškog lečenja oboljenja gastrointestinalnog segmenta kod gerijatrijskih bolesnika. Ispitivanjem je obuhvaćeno ukupno 73 bolesnika koji su sačinjavali ispitivanu grupu i 85 bolesnika kontrolne grupe. U ispitivanoj grupi, kod 29 bolesnika (40.05%), evidentirana su hronična srčana oboljenja, a kod 18 bolesnika hipertenzija. Ova studija je pokazala da je karcinom želuca bio znatno zastupljeniji kod bolesnika starijeg životnog doba (23.28%) u odnosu na bolesnike kontrolne grupe (10.59%). Krvareći želudačni ulkus (16.43%), perforativni želudačni ulkus (12.30%) i perforativni duodenalni ulkus (12.30%) predstavljaju najčešća patološka stanja gornjeg segmenta digestivnog trakta kod bolesnika starijeg životnog doba. Najčešće neposredne postoperativne komplikacije u ispitivanoj grupi bolesnika od strane organskih sistema bile su: kardiovaskularne 12.50% i respiratorne 2.88%. Najčešće hirurške komplikacije bile su: infekcija rane 25.14%, serom u rani 9.67%, dehiscencija anastomoze 5.48%. U kontrolnoj grupi bolesnika, najčešće postoperativne komplikacije bile su od strane kardiovaskularnog sistema, 7.05% a 1.17% od strane respiratornog sistema. Hirurške komplikacije bile su zastupljene sa sledećom učestalošću: serom u rani 5.88%, infekcije rane 4.70%, dehiscencije anastomoza 2.36%. Ukupna postoperativna smrtnost bila je znatno zastupljenija u ispitivanoj (24.6%) u odnosu na kontrolnu grupu (8.23%). Bolesnici starijeg životnog doba, s obzirom na prisustvo većeg broja hroničnih oboljenja i učestale postoperativne komplikacije, zahtevaju planiranu preoperativnu pripremu i intenzivnu postoperativnu negu.

Ključne reči: **gastrointestinalni segment, pacijenti starije životne dobi**