

Research Article

Correlation of Clinical, Ultrasound and CT Findings in Patients with Acute Pancreatitis

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Abstract

Acute pancreatitis represents a set of dynamic and systematic and pathophysiological changes which are a result of autodigestive activation of pancreatic proenzyme, within gland parenchyma itself. The goal of the project included to determine the frequency of acute pancreatitis according to sex, age groups and severity of clinical picture. The goal was also to determine an correlation of obtained clinical, biohumoral, ultrasound, and CT (computed tomography) changes in acute pancreatitis, and the course and prognosis of the examined patient's illness. The project also deals with the correlation of etiologic factors with the course and prognosis of the disease.

Methods: This study included 273 patients with acute pancreatitis, classified according Ranson's criteria, with their clinical, ultrasound, endoscopy, radiology, and CT findings also classified and compared according the severity rate.

Results: No differences by the frequency, severity of clinical picture, course, and outcome of the disease between the sexes, ($p > 0,01$), the differences in distribution of frequency are significant when it comes to the etiological factor ($p < 0,01$). A significant correlation is established between severity of a disease by Ranson's score and ultrasound findings by Balthazar's score ($r = 0,448$ P -vrednost = 0,0001). The high degree correlation ($r = 0,778$ $p = 0,0001$) is also proved between ultrasound and CT findings by Balthazar's score in acute pancreatitis. CT finding correlates ($r = 0,415$ $p = 0,001$) with clinical picture of acute pancreatitis.

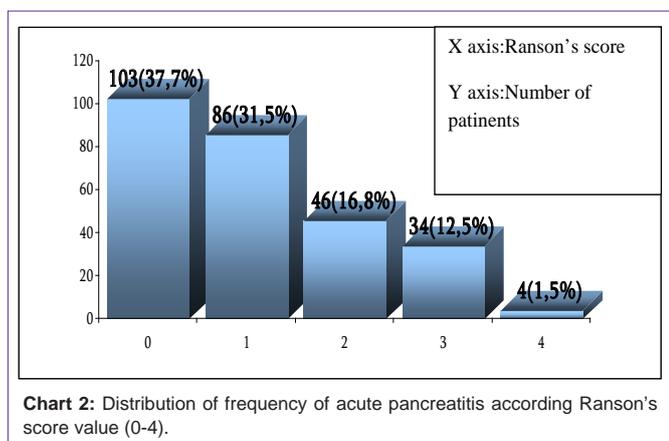
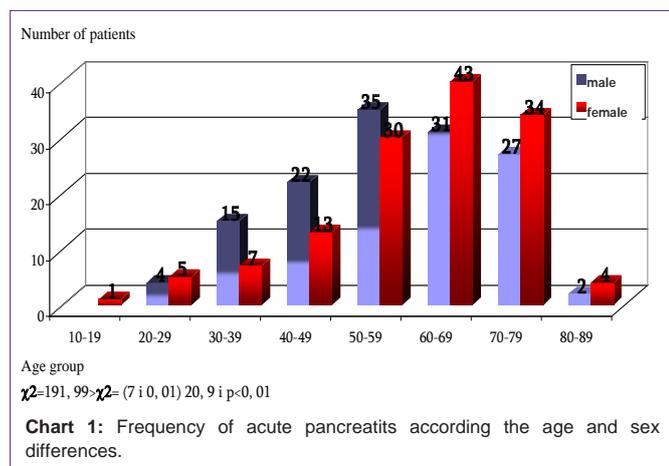
Conclusion: There is a significant correlation of severity a disease by Ranson's score and ultrasound and CT findings by Balthazar's score, and Clinic and ultrasound in acute pancreatitis.

Key words: Acute pancreatitis, ultrasound, correlation

Introduction

Acute pancreatitis represents a set of dynamic and systematic and pathophysiological changes that are a result of autodigestive activation of pancreatic proenzyme, within gland parenchyma itself. In Europe, the incidence of acute pancreatitis is between 17.5 and 73.4 to 100.000 people, which indicates to epidemiological social significance of this disease [1,2]. The incidence of acute pancreatitis is significantly rising within the last few years, and the reason could be the routine testing of pancreas enzymes by the urgent condition with acute abdominal pain and in the raise of incidence of biliary lithiasis and obesity in the population [1]. There are mild and severe forms of acute pancreatitis. Mild forms, which occur in 80 to 90% of cases, correspond to so-called acute edematous pancreatitis, with the moderate edema of parenchyma, which ends with no major complications after the conservative therapy. There are major complications in severe hemorrhagic necrotic form of this disease, which occurs in 10 to 20% cases, which are threatening to vital functions and cause possible death due to the shock, hydroelectrolytic disorder, sepsis, metabolic disorders and multiple organ failure. Despite to the progress in diagnostic and therapy 10-25% of patients with severe form of acute pancreatitis end with lethal outcome. Two most common causes of acute pancreatitis, in 60-90% of cases, are biliary lithiasis and

chronical consuming of alcohol. In an urban environment, more common cause is the consuming of alcohol, while the dominant cause in other environments is biliary calculosis. There are several theories which explain pathophysiological mechanism of the formation of the acute pancreatitis, but the most significant theories are the theory of primary lesion of acinic cells and theory of ductal obstruction with the bile reflux. The activated enzymes of pancreas (trypsin, chemotrypsin, kallikrein, elastase, phospholipase A) enter the systematic circulation and cause the shock using different mechanisms. That causes a higher production and the release of inflammatory cytokines from neutrophils, macrophages and lymphocytes, like II-, II-6, II-8 and the tumor necrosis factor alpha (TNF- α). That causes the syndrome of systematic inflammatory response (SIRS) which requires at least 2 of the next criteria: a puls above 90/min, number of respirations above 20/min, or PCO_2 under 32mmHg, number Le under 4.000 or above 12.000 by mm cube, rectal temperature under 36 or above 38 degrees by Celsius and syndrome of multiorganic failure (MOF) [2,3,4], like systolic pressure under 90mmHg, PaO_2 under 60mmHg, serum creatinine above 177 μ mol/l. Bleeding in GI tract above 500ml/24h. Different grading systems are used for estimation of clinical picture and the disease prognosis, like Ranson's score, Glazgov's score, APACHE II score and others. Besides clinical, different morphological scoring systems are used (ultrasound, CT- Computed



Tomography and NMR-Nuclear Magnetic Resonance) [5]. The aim is the estimation of the severity degree and the prognosis of acute pancreatitis by the correlation of obtained clinical, ultrasound, and CT analysis, as well as the review of the etiological factors correlated with the course and prognosis of the disease.

Material and Methods

The retrospective-prospective study has included 273 patients (137 females and 136 males), with the average age of $58,08 \pm 0,79$ (between the age of 18 and 85), treated on the Clinic for gastroenterology and hepatology, from 2009 to 2012, with the diagnosis of acute pancreatitis. During the first 48 hours of hospitalization, patients had upper abdominal organ ultrasound examination (pancreas ultrasound examination). Ultrasound examinations were performed with real time devices SIEMENS ACUSION X300 with color Doppler, and also with TOSHIBA ECOSEE 75 with color Doppler, with sector and convex probes with the frequency of 3 and 3,5MHz. Clinical parameters were the level of blood pressure and the pulse frequency. The certain number of patients (61) was subjected to CT examination of the upper abdomen with contrast, and the ultrasound examination of upper abdomen, and they are compared to each other in the same patients. Clinical parameters, by the use of Ranson's score and ultrasound examination, were the criteria for the classification of patients in the group of mild of the group of severe acute pancreatitis form. By the level of Ranson's score, patients with the level of 0-2 are classified in the group of mild acute pancreatitis form, and patients with the score 3 or higher, are classified in the severe form group. The

Ranson's criteria within 48h of hospitalisation include: the age of the patient (the age above 70 is significant), the value of glycemia (the value above 10mmol/l is significant, except for diabetics), the value of ALT (aspartate of aminotransferase, significant values are above 200 IU/ml), the LDH value (lactate dehydrogenase, significant values are above 600 IU/ml), number of leukocytes in peripheral blood (the significant enlargement is above $15000/\text{mm}^3$).

The Balthazar's grading system of ultrasound changes and changes on CT of the examined patients is used for examined patients, whose reports on pancreas and abdomen are classified from degree A to E. The numeric version of 0-4 is associated to each of these degrees: normal pancreas corresponds to the score of 0, focal or diffuse enlargement without peripancreatic lesions with smaller or larger intra pancreatic liquid collection, corresponds to the score of 1. Lesions from the previous stage plus enlargement plus peripancreatic inflammatory changes correspond to the score of 2, lesions from the previous stages plus enlargement with per pancreatic liquid collection, corresponds to the score of 3, lesions from the previous stages extensive liquid per pancreatic formations, correspond to the score of 4. Besides Balthazar's system in CT acute pancreatitis classification, the necrosis score is also used. No necrosis, corresponds to the score of 0, necrosis is found on 1/3 of gland, corresponds to the score of 2, necrosis is found on 1/2 of gland, corresponds to the score of 4, necrosis is found on 2/3 of gland, corresponds to the score of 6. We have only compared the obtained values of Balthazar score using the same criteria for both morphological methods. Necrosis score could not be compared between US and CT because of limited capability of ultrasound to distinguish the necrosis and other changes like liquid area. Clinical hemodynamic indicators such as pulse frequency and value of high blood pressure are graded from 0 to 2. The clinical outcome in these groups is compared, in terms of average length of hospitalization and the outcome of treatment. The degree of the correlation between clinical, ultrasound and CT examination, and benefit of these diagnostic methods for predicting the course and disease outcome. To evaluate the severity and presence of complications, some patients underwent X-rays of the chest (pleural effusion presence, infiltration, etc.), with the grading of the findings to the appropriate score. Native X-rays of the abdomen was carried out and the in the standing position in order to exclude the presence of intestinal obstruction or pneumoperitoneum as the cause of pain, but also to define better the diagnostic pain in the abdomen, where the findings also graded according to the appropriate score. Proximal endoscopy was performed in some patients in whom there was a suspicion of gastrointestinal bleeding, peptic ulcer disease, or damage to the digestive tract within multiorgan failure. We used the video gastroscope PENTAX A -120 663, as well as light source Pentax EPK 1000 with LCD Monitor Sony LMD-1950 MD.

The processed results of examination are showed graphically and in table. The results analysis is done with standard statistic tests such as the arithmetic mean, standard deviation, Student's t test, Fisher's test, the test of linear correlation by Spearman and χ^2 test.

Results

A statistically significant difference in the distribution of acute pancreatitis frequency is determined, depending on age, with the highest expression in the seventh decade ($p<0, 01$), and it's also

Table 1: Represents the most important variables in the group of alcoholic pancreatitis.

Variable	N	ean	StDev	SE Mean	95% CI
age	78	52.12	13.85	1.57	(48.99;55.2)
Lenght of hospitalisation-days	78	6.91	4.78	0.54	(5.83;7.99)
Glycemia mmol/l	78	6.71	2.67	0.30	(6.11;7.31)
LDH value IU/l	78	520.3	305.1	34.5	(451.6;589.)
AST value IU/l	78	91.1	123.6	14.0	(63.3;119.0)
Le value/10 ⁹	78	12.54	9.68	1.10	(10.36;14.7)
CRP value mg/l	27	162.6	152.8	29.4	(102.1;223.)
Ca+++value mmol/l	78	2.30	0.16	0.018	(2.27;2.34)
Triglic.value mmol/l	78	1.87	1.11	0,12	(1,62;2,12)
Cholesterol mmol/l	78	5.15	1.66	0.18	(4.77;5.52)
SAmylase IU/l	78	877.9	809.6	91.7	(695.3;1060.4)
U/U Amylase IU/l	46	10903	13255	1954	(6967;1483)
ALT value IU/l	78	109.4	159.9	18.1	(73.3;145.4)
GGT Value IU/l	78	255.9	263.5	29.8	(196.5;315.)
AST/ALT ratio	78	1.22	0.91	0.10	(1.02;1.43)

Table 2: Represents the most important variables in the group of biliary pancreatitis.

Variable	N	Mean	StDev	SE Mean	95% CI
age	157	61.7	13.7	1.1	(59.5;63.8)
lenght of hospitalisation-days	157	6.36	3.22	0,25	(5.8;6.8)
glycemia value mmol/l	157	7.17	3.34	0.26	(6.6;7.7)
LDH value IU/l	157	593.4	442.2	35.3	(523.7;663.1)
AST value IU/l	157	186.3	195.8	15.6	(155.4;217.2)
Le value/10 ⁹	157	10.66	4.50	0.35	(9.95;11.37)
CRP value mg/l	59	91.8	112.6	14.7	(62.5;121.2)
Ca+++ value mmol/l	157	2.29	0.17	0.01	(2.26;2.31)
Triglic.value mmol/l	157	1.64	1.82	0.14	(1.3;1.9)
Cholesterol mmol/l	157	9.28	50.52	4.03	(1.31;17.24)
S Amylase IU/l	157	1225	1420	113	(1001;1449)
U/UAmylase IU/l	69	11299	14519	1748	(7811;14787)
ALT value IU/l	157	287,8	253,0	20,2	(247,9;327,7)
GGT value IU/l	157	308.0	313.8	25.0	(258.5;357.5)
AST/ALT ratio	157	0.86	1.43	0.11	(0.63;1.08)

determined that the highest expression frequency by males is in slightly younger age (sixth decade). In younger age groups males are prevalent and in older age groups females are prevalent. The value obtained by test of frequency distribution is $\chi^2=191,99 > \chi^2(7 \text{ and } 0,01)=20,9$ and $p < 0,01$ (Chart 1). It is determined that there is no difference in the structure of patients by the severity degree of acute pancreatitis clinical appearance between sex: $\chi^2=1,05 < \chi^2(1 \text{ and } 0,01)=6,63$ ($p > 0,01$), 37,7% of total patients had Ranson's score 0, 31,5% had Ranson's score 3 and 1,45% patients had Ranson's score 4 (Chart 2). The average value of Ranson's score was statistically higher in the group of patients with severe compared to the group with mild form ($3,11 \pm 0,05$ and $0,76 \pm 0,05$, respectively) acute pancreatitis ($t=4,24 > 2,58$, $p < 0,01$). The ratio of the average values of Ranson's score between the

groups of alcoholic (Table 1) and biliary pancreatitis (Table 2), didn't show statistically significant difference ($t=0,0025 < 1,96$, $p > 0,01$), 235 (86,1%) of total number of patients were in the group of mild, and 38 (13,9%) were in the group of severe acute pancreatitis form $t=4,38 > 2,58$, if $p < 0,01$. In the biliary pancreatitis group, the average age is significantly higher than the age in the alcoholic pancreatitis group, $t=4,97 > 2,58$, $p < 0,01$. According to the distribution of patients by etiology, in our group the most common were patients with biliary pancreatitis, 157 (57,51%), then with alcohol 78 (28,57%), idiopathic or unknown etiology pancreatitis 26 (9,52%), caused by hyperlipidemia 10 (3,67%), caused by ERCP of other causes 2 (0,73%) (Table 3). We have determined that there is no statistically significant difference in the number of treated patients yearly in the period of monitoring from 2009 to 2012, $\chi^2=10,39 < \chi^2(3 \text{ and } 0,01)=11,34$, $p > 0,01$ the frequency distribution of hospitalized patients doesn't depend on age of monitoring.

In our study by initial ultrasound examination, the pancreas is successfully perceived in 84,9% of patients. The presence of statistically significant medium degree correlation between the value of Ranson's score as a parameter of clinical appearance severity and the value of ultrasound score by Balthazar ($r=0,448$, $p=0,0001$) (Chart 3) is determined. Also, the statistically significant high degree correlation between the values of ultrasound and CT score by Balthazar is determined. ($r=0,778$, $p=0,001$) (Chart 4).

Comparing the value of Ranson's score and the score of native X-ray of abdomen, low level of positive correlation was found, $r=0,134$, $p \text{ value}=0,09$. Also, comparing the value of Ranson's score and the score of upper gastrointestinal endoscopy no statistically significant correlation was found, $r=0,089$, $p \text{ value}=0,04$. Between the values of Ranson's score and the score of chest radiography low level of correlation was found, $r=0,203$, $p \text{ value}=0,01$.

When it comes to basic hemodynamic parameters, as well as their predictive prognostic relationship with clinical course and outcome, our study found a negative correlation between the value of Ranson's score and rank values of arterial blood pressure, $r=-0,182$, $p=0,003$. Ranson's score also correlate with pulse-frequency in the sense of a low degree of positive correlation, $r=0,261$, $p < 0,0001$, Pearson's test.

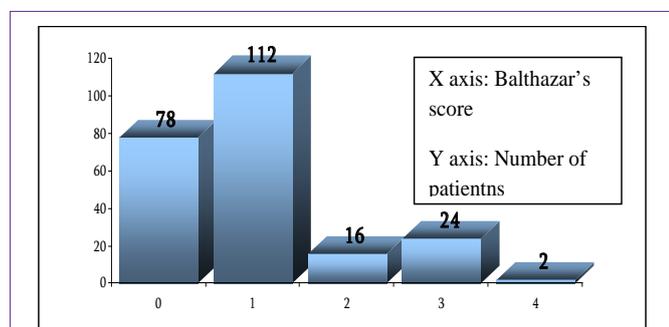
There is no statistically significant connection between major etiological factors and the treatment outcome of patients with acute pancreatitis $\chi^2=0,52 < \chi^2(1 \text{ and } 0,01)=6,63$, $p > 0,01$, and there is no significant connection between etiological factor and mortality, ($p=1,0 > 0,05$) (Table 4). There is no statistically significant connection between the sex affiliation ($\chi^2=0,1 < (1 \text{ and } 0,01) \chi^2=6,63$, $p > 0,01$) and the treatment outcome and mortality ($p=1,0 > 0,05$) (Table 5).

Discussion

Epidemiological data show the increase in frequency of acute pancreatitis. Biliary pancreatitis is more common in women, alcohol is more common in men, idiopathic occurs equally in both men and women [6]. Our results are in accordance with the distribution of patients by sex in literature data. Also, we have determined that there is no difference in terms of distribution of patients by the severity of acute pancreatitis clinical appearance depending on sex and etiology. This cognition is in accordance with literature data. De Campos and his associates [7] said that there is no significant difference between

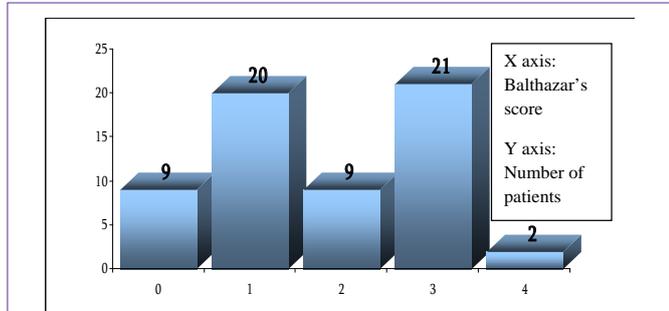
Table 3: Structure of patients with acute pancreatitis according to etiology, sex and age.

Etiology	Sex	Year of hospitalization								total Number
		2009		2010		2011		2012		
		Num.	%	Num.	%	Num.	%	Num.	%	
1 Alcohol	Male	5	6,8%	26	35,6%	21	28,8%	21	28,8%	73
	Female		0,0%	2	40,0%		0,0%	3	60,0%	5
	Total	5	6,4%	28	35,9%	21	26,9%	24	30,8%	78
2 Biliary	Male	9	18,0%	15	30,0%	13	26,0%	13	26,0%	50
	Female	23	21,5%	26	24,3%	27	25,2%	31	29,0%	107
	Total	32	20,4%	41	26,1%	40	25,5%	44	28,0%	157
3 Hyperlipidemia	Male	3	37,5%	2	25,0%		0,0%	3	37,5%	8
	Female	1	50,0%		0,0%	1	50,0%		0,0%	2
	Total	4	40,0%	2	20,0%	1	10,0%	3	30,0%	10
4 Unknown	Male		0,0%	2	40,0%	1	20,0%	2	40,0%	5
	Female	6	28,6%	2	9,5%	5	23,8%	8	38,1%	21
	Total	6	23,1%	4	15,4%	6	23,1%	10	38,5%	26
5 Post ERCP and other	Male		0		0		0		0	0
	Female		0,0%	2	100,0%		0,0%		0,0%	2
	Total	0	0,0%	2	100,0%	0	0,0%	0	0,0%	2
Total	Male	17	12,5%	45	33,1%	35	25,7%	39	28,7%	136
	Female	30	21,9%	32	23,4%	33	24,1%	42	30,7%	137
	Total	47	17,2%	77	28,2%	68	24,9%	81	29,7%	273



$r=0,448$, $P\text{-Value}=0,0001$ correlation of medium degree between ultrasound score by Balthazar and Ranson's score.

Chart 3: Distribution of frequency of patients with acute pancreatitis according to echosonography criteria by Balthazar score. (0-4).



$r=0,778$ $P\text{-Value}=0,0001$, high degree correlation between the value of ultrasound and CT score by Balthazar; $r=0,415$ $P\text{-Value}=0,001$ medium degree correlation between the CT score by Balthazar and Ranson's score.

Chart 4: Distribution of frequency of acute pancreatitis according to CT score by Balthazar (0-4).

the groups of patients with or without systematic complications, as well as between the groups of survivors and deaths when it comes to age and sex, as well as etiological factor. Kaya and associates [8], as well as Papanicolaou and associates [9] obtained similar results.

We established that there is no statistically significant difference in the number of treated patients yearly in period from 2009 to 2012. According to some authors, such as Tonsy and associates [10], in the last few years there is the enlargement of acute pancreatitis incident ion increase in incidence of acute pancreatitis due to increase enlargement of biliary acute pancreatitis frequency and use of modern diagnostic methods.

According to etiology, the most frequent pancreatitis in our group of patients was biliary, then alcoholic, idiopathic, hyperlipidaemia, ERCP, or other causes. In their series of 199 patients, Kaya and associates [8], found 53% of those with biliary etiological factor, and 26% of those with idiopathic pancreatitis. Similar results showed some other studies [11]. In the series of 153 patients, Chazicostas and associates [12] found biliary etiology in 67,3%, alcoholic in 9,2%, idiopathic in 17%, and in 6,5% of cases different mixed etiological factors.

The frequency of acute pancreatitis by our patients is not equally distributed by age groups, with the top expression in seventh decade of lifetime. It is also observed that the top acute pancreatitis frequency by men is in slightly younger age group (sixth decade of lifetime), as well as that, in younger age groups, males are prevalent, and in older groups females are prevalent, which is consistent with literature data [12,13].

Banks and associates [13] cite that about 85% cases concerned

Table 4: Relation between the most frequent etiology groups and mortality

Etiology	End point of treatment - mortality				Summary
	Released		Died		
	Number	%	Number	%	Number
Alcoholic	63	100.0%	0	0.0%	63
Biliary	131	98.5%	2	1.5%	133
Summary	194	99.0%	2	1.0%	196

p=1, 0>0,05 Fisher's test of exact probability

Table 5: Relation between sex and mortality in acute pancreatitis.

Sex	End point of treatment-mortality				Summary
	Released		Died		
	Number	%	Number	%	Number
Men	135	99.3%	1	0.7%	136
Women	136	99.3%	1	0.7%	137
Summary	271	99.3%	2	0.7%	273

p=1, 0>0,05 Fisher's test of exact probability.

mild form of interstitial pancreatitis, and in the rest 15% of cases concerned severe form of necrotic pancreatitis. According to the same authors, rates of total mortality in acute pancreatitis are from 3-5% by interstitial and 17% by necrotizing pancreatitis (from 12% by sterile necrosis to 30% by infective necrosis). In our series of patients with acute pancreatitis, there were 235 (86,1%) of patients with mild and 38 (13, 9%) of patients with severe form of the disease according to Ranson's criteria, which is consistent to literature data [12,13]. We found the significant difference in the medium values of Ranson's score between the population with mild and severe form of acute pancreatitis. Ranson's score, according to Soumitra and associates [11] can be considered as reliable factor in prediction of acute pancreatitis patient's clinical course and outcome, and is completely comparable with other systems of evaluation (APACHE score). The mortality, according to these authors, in absence of organs failure was 0%, with one organ system failure to 3% (from 0-8%), and by more organ systems failure was 47% (from 28-69%). In our population of patients, the mortality rate was 0,73% (2 patients). Other authors [9, 12-15] mention the mortality rate of 2-4%.

Literature data show that it is not always possible to adequately perceive pancreas because of the abundance of gases, but also because of poor preparation and cooperation of patients. According to Jeremic and associates [16], the percentage of pancreas non perceivment during the initial ultrasound examination is from 20-50%. In our study, the pancreas is successfully perceived by initial ultrasound examination in 84,9%. The distribution of acute pancreatitis patients frequency according to Ranson's score shows progressive decrease of number going from lower to higher scores of Ranson's score. However, the distribution of patient's frequency is similar by ultrasound examination degree according to Bathazar's score. This fact is in accordance with literature data of Rickes and associates [17], who question the correlation of clinical status, CT examination and ultrasound in their study with 31 patients with acute pancreatitis. Pandey and associates [18] also, in their study with 110 acute pancreatitis patients reach similar conclusions.

When it comes to the relation between ultrasound and CT results by our acute pancreatitis patients, the high degree positive

correlation is found. This fact is in accordance with the other authors results [17,18]. The value of Ranson's score and CT score according to Balthazar also correlate in our study, with the existence of medium degree positive correlation, as well as according to the literature data [17,19].

Plain abdominal X-ray film, often applied as a diagnostic tool in acute pancreatitis, the Pearson's test showed a positive low-level correlation between Ranson's score value and plain abdominal X-ray score. This fact is explained by the ileus, which can be seen with plain film of the abdomen, and can be a sign of easing vital organs, according to the Hirota and associates [19].

Between gastroscope findings and Ranson's score, Pearson's test shows no statistically significant correlation. This data is also consistent with some literature data. Hirota and associates [19] cite a study with 17 patients with a severe form of acute pancreatitis, which is measured by the level of gastric pH within the first 48 h of admission, where he established higher mortality rate in patients with a low pH value, as well as many failure of organ systems in these patients, but emphasizes, however, that gastric pH cannot be taken as a parameter for the diagnosis and differentiation between severe and mild clinical form of pancreatitis.

Findings of X-rays of the chest, graded and compared with Ranson's score, indicates a low degree of positive correlation. According to Hirota and co-workers [19], early pleural effusion in patients with acute pancreatitis can be a sign of inflammation and enlarged unilateral or bilateral effusions may be associated with poor outcome.

Our study found a low-grade negative correlation between the value of Ranson's score and rank values arterial blood pressure. Value of Ranson's score also correlates with pulse frequencies in terms of a positive correlation of low degree, as already described in other studies [5,13,20,21].

When it comes to the clinical course of the disease, we have compared the length of hospitalisation between the groups with severe and mild acute pancreatitis form and we haven't found a statistically significant difference. This result is not in accordance with the most literature data, where there is statistically significantly longer hospitalization of patients with severe form of acute pancreatitis [18-21]. However, De Campos and associates [7], and the others [22], also cite that there is no statistically significant difference between the groups with and without systematic complications and groups of survivors and deaths when it comes to the length of hospitalization in days. According to our tests, there is no statistically significant difference between the length of hospitalization and acute pancreatitis etiology (biliary or alcoholic). We also established that the average age in the group of patients with severe form of acute pancreatitis is higher compared to the group the group with mild form, which is in accordance with the study of Nojgaard and associates [23], which shows higher mortality in older population.

Conclusion

The acute pancreatitis is equally represented in both males and females. There is a significant difference of the frequency indention between men and women when it comes to the etiology of the disease, biliary pancreatitis is more frequent by females, and alcoholic

pancreatitis is more frequent in males. There is no significant difference if the clinical appearance and outcome between the sexes. The frequency distribution is significantly different depending on the age of patients, with the top expression in older ages, provided that in the younger age groups there are more male cases, and in the older more female cases. Average age is significantly higher in the severe form of acute pancreatitis. According to etiology, the most often are biliary and alcoholic pancreatitis. The mild form of acute pancreatitis is more prevalent compared to the severe form. The values of Ranson's score are significantly higher in the group of patient with severe form. There is a significant correlation between acute pancreatitis severity degree and ultrasound and CT results according to Balthazar's score. CT and ultrasound result significantly correlates with the acute pancreatitis clinical appearance severity by Ranson's score. There is a high degree of correlation between ultrasound and CT findings in patients with acute pancreatitis, which indicates the diagnostic value of ultrasound performed by trained ultrasonographer. The clinical picture of pancreatitis by Ranson's score correlates with plain film of the abdomen score. Between gastroscop findings and Ranson's score there's no statistically significant correlation.

X-ray of the chest score and value of pulse frequencies correlate by positive low level. Also, arterial blood pressure correlates with Ranson's score by negative low level, and the other hemodynamic parameter, pulse, correlates with the value of Ranson's score by positive low level.

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