Analysis of Patients with Acute Pancreatitis: 2 Years Experience

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ABSTRACT

Objective: This study aimed to discuss the demographic, biochemical data, treatment and outcome status of patienedts we follow with acute pancreatitis in the light of current literature data.

Material and Methods: Two hundred and sixty patients were included in the study. Age, sex, additional disease information, etiological cause, endoscopic retrograde cholangiopancreatography (ERCP) results, patients' service, intensive care and total hospitalization times, Ranson scores and outcomes were recorded from the file data. Hemogram and biochemical parameter levels of the patients were recorded. All analyzes were done using SPSS 22.0 statistical software package. Continuous variables in group data were indicated with mean ± standard deviation. Categorical variables were stated with numbers and percentages. While Student's t test was used in the analysis of continuous variables with normal distribution, Mann-Whitney U test was used for independent intergroup comparison of continuous or ordinal dependent variables of non-normally distributed or different groups. According to the etiology, hospitalization times and Ranson scores were compared using the Kruskal Wallis test. Whether there is a relationship between the countable parameters or not was evaluated by the "Pearson's and Spearman's" correlation analysis. Statistical significance was accepted if p< 0.05.

Results: Mean age of the patients was 62.99 ± 17.8. It was determined that the group with the longest intensive care unit hospitalization period was in the group connected to gallstones. The longest hospitalization period was in the group of patients with alcohol-induced acute pancreatitis. Ward, intensive care and total hospital stay were found to be significantly higher in the ERCP group.

Conclusion: Acute pancreatitis is a disease that has a regionally different etiology, and differences in preferred scoring system and treatment modality. Being one of the most common gastrointestinal diseases in the world and increasing in frequency necessitate the evaluation of this disease with new data and different perspectives.

Keywords: Acute pancreatitis, endoscopic retrograde cholangiopancreatography, gallstone

ÖZ

Akut Pankreatitli Hastaların Analizi: 2 Yıllık Deneyim

Giriş: Kliniğimizde akut pankreatit ile takip ettiğimiz hastaların demografik, biyokimyasal verilerini, tedavi ve sonlanım durumlarını güncel literatür verileri ışığında tartışmayı amaçladık.

Gereç ve Yöntemler: Boplam 260 hasta çalışmaya dahil edildi. Hastaların yaş, cinsiyet, ek hastalık bilgisi, etyolojik neden, endoskopik retrograd kolanjiopankreotografi (ERCP) sonuçları, hastaların servis, yoğun bakım ve toplam yatış süreleri, Ranson skorları ile sonlanımları dosya verilerinden alınarak kaydedildi. Hastaların hemogram ve biyokimyasal parametre düzeyleri kaydedildi. Tüm analizler SPSS 22,0 istatistiksel yazılım paketi kullanılarak yapıldı. Grup verilerindeki sürekli değişkenler ortalama ± standart sapma ile belirtildi. Kategorik değişkenler ise sayı ve yüzde ile belirtildi. Normal dağılım gösteren sürekli değişkenlerin analizinde Student t testi kullanılırken, normal dağılım göstermeyen veya birbirinden farklı grupların sürekli veya ordinal bağımlı değişkenlerin bağımsız gruplararası karşılaştırılmasında Mann-Whitney U test kullanıldı. Etyolojiye göre hastane yatış süreleri ile Ranson skorlarının karşılaştırmaları Kruskal Wallis testi kullanılarak yapıldı. Sayılabilir parametrelerin arasındaki ilişki varlığı olup olmadığı "Pearson's and Spearman's" korelasyon analizi ile değerlendirildi. İstatistiksel anlamlılık p< 0.05 olması durumunda kabul edildi.

Bulgular: Hastaların yaş ortalaması 62.99 ± 17.8 idi. En uzun yoğun bakım yatış süresine sahip grubun safra taşına bağlı olan grupta olduğu saptandı. Toplam yatış süresi en uzun hasta grubu alkole bağlı akut pankreatit grubunda idi. ERCP yapılan grupta servis, yoğun bakım ve toplam hastane yatış sürelerinin yapılan grupta anlamlı yüksek olduğu saptandı.

Sonuç: Akut pankreatit, bölgesel olarak etyolojisi değişen, tercih edilen skorlama sisteminde ve tedavi modalitesinde farklılıklar izlenebilen bir hastalıktır. Dünyada en sık görülen gastrointestinal hastalıklardan birisi olması ve bu sıklığın giderek artması, bu hastalığın sürekli yeni veriler ve farklı bakış açılarıyla değerlendirilmesini gerektirmektedir.

Anahtar Kelimeler: Akut pankreatit, endoskopik retrograd kolanjiopankreotografi, safra taşı

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INTRODUCTION

Acute pancreatitis is a frequently diagnosed disease in hospital presentations with symptoms related to the gastro-intestinal system, and its incidence increases every passing year (1). The regional etiology, demographic distribution and even treatment modalities may vary in this disease detected with its characteristic symptoms, laboratory findings and imaging methods. There are different scoring systems such as RANSON, APACHE II and BISAP worldwide and are used for prognostic and diagnostic purposes in patients with acute pancreatitis. Its association with comorbid diseases, the fact that it can cause local and systemic complications and the presence of treatment modalities including invasive methods make it vital for this disease to be approached multi-directionally.

In our study, it was aimed to discuss the demographic characteristics, biochemical data, and treatment and outcomes of acute pancreatitis patients we followed in our clinic in the light of current literature data.

MATERIALS and METHODS

Patient Selection and Study Design

Files of patients admitted to the gastroenterology clinic of our hospital and diagnosed having acute pancreatitis between January 1st 2018 and December 31st 2019 were retrospectively reviewed. Study inclusion criteria were age over 18 years and complete access to patient files. A total of 312 files were scanned. Patients under the age of 18, those whose file data could not be completely accessed, those having cardiac arrest in the emergency service, those who died, and those with amylase elevation without acute pancreatitis were excluded from the study. A total of 51 patients that complied these criteria were excluded. A total of 260 patients that fit the inclusion criteria were included into the study. Patients' age and sex, information on additional diseases, etiologic cause, results of endoscopic retrograde cholangiopancreatography (ERCP), length of ward and ICU stay and total length of hospital stay of the patients, and RANSON score outcomes were recorded from patient files.

The study was carried out in accordance with Helsinki Principles, and Local Ethics Committee approval was obtained (Adana City Hospital, Ethics Committee, Meeting Number: 55, Decision Number: 818, 22/04/2020).

Laboratory Analysis

Patients' white blood cell, hemoglobin, hematocrit, and platelet counts were recorded. Out of biochemical parameters, levels of glucose, urea, creatinine, alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkalane phosphatase (ALP), gamma glutamyl transferase (GGT), lactate dehydrogenase (LDH), albumin, total and direct bilirubin, amylase, total cholesterol, triglyceride, low and high-density lipoprotein cholesterols (LDL and HDL), C-reactive protein (CRP) and calcium were recorded. Complete blood count was performed using Beckman Coulter DXH 800 device. Measurements of biochemical parameters were carried out using automated chemistry analyzer (Abbott Aeroset, MN, USA) and appropriate commercial kits (Abbott). LDL, HDL and triglyceride levels were measured using appropriate commercial kits (Beckman Coulter).

Statistical Analysis

All analyses were performed using SPSS 22.0 (Chicago, IL, USA) statistical software package. Kolmogorov-Smirnov test was used to evaluate normality of the distribution of continuous variables. Continuous variables in group data were expressed as mean ± standard deviation. Categorical variables were given as number and percentage. Student's t-test was used in the analysis of continuous variables with normal distribution and Mann-Whitney U test was used in the independent inter-group comparisons of continuous or ordinal variables without normal distribution or of groups different from each other. Comparisons between length of hospital stay as regards etiology and RANSON score were performed using Kruskal Wallis test. Relation between countable parameters was evaluated with "Pearson's and Spearman's" correlation analysis. Statistical significance was accepted as $p < 0.05$.

RESULTS

Mean age of the patients was 62.99 ± 17.8 years. While 37.31% of the patients were males (n= 97), 62.69% were females (n= 163). Of the patients, 19.23% had a history of diabetes mellitus. While the most common etiology was gallstones (53.46%, n= 139), patients without etiology ranked second (43.08%, n= 112). While 259 (99.62%) patients were discharged from the hospital, only one (0.38%) patient was lost. Seventy-three (23.08%) patients had ERCP indication (Table 1). Table 1 summarizes the patients' laboratory findings, length of hospital stay, RANSON scores, and laboratory data.

When etiological causes were grouped and compared according to RANSON scores and length of hospital stay, a statistical significance was not found between the groups in terms of ward stay, but the group with the longest ICU stay was found to be the one with gallstones, and the difference was found to be statistically significant. The longest length of total hospital stay was determined to be in the group with alcohol-associated acute pancreatitis, and this difference was found to be statistically significant (Table 2). RANSON score, CRP and white blood cell count were detected significantly high in the group with ICU stay (Table 3).

Table 1. Demographics, etiology, Ranson score, outcomes and laboratory analysis of the patients

	n	%
Sex		
Male	97	(37.31)
Female	163	(62.69)
Diabetes mellitus (DM)		
Absent	210	(80.77)
Present	50	(19.23)
Etiology		
Absent	112	(43.08)
Alcohol	3	(1.15)
Gallstone	139	(53.46)
Viral	1	(0.38)
Lipemia	4	(1.54)
Post-ERCP	1	(0.38)
Outcome		
Exitus	1	(0.38)
Discharged	259	(99.62)
Endoscopic retrograde cholangiopancreatography		
Performed	187	(71.92)
Not performed	73	(28.08)
Parameters	**Mean ± S.D.**	**Median**
Age (year)	62.99 ± 17.80	63.50
Length of ward stay (day)	2.49 ± 0.82	2.00
Length of ICU stay (day)	2.17 ± 1.85	2.00
Total length of hospital stay (day)	4.59 ± 2.14	4.00
Ranson score	1.07 ± 1.06	1.00
Glucose (mg/dl)	140.62 ± 76.95	115.50
Urea (mg/dl)	30.45 ± 17.51	26.00
Creatinine (mg/dl)	0.82 ± 0.37	0.74
AST (U/L)	153.83 ± 198.63	88.00
ALT (U/L)	164.40 ± 166.65	116.00
ALP (U/L)	165.74 ± 181.34	110.50
GGT (U/L)	253.10 ± 298.50	131.00
Albumin (g/L)	3.79 ± 0.48	3.83
Total bilirubin (mg/dl)	2.20 ± 2.86	1.16
Direct bilirubin (mg/dl)	1.49 ± 2.25	0.50
Amylase (U/L)	822.81 ± 567.47	597.00
LDH (U/L)	271.47 ± 161.11	232.00
Total cholesterol (mg/dl)	191.02 ± 53.93	189.50
Triglyceride (mg/dl)	305.00 ± 119.37	285.00
HDL (mg/dl)	37.62 ± 9.49	36.00
LDL (mg/dl)	115.07 ± 34.24	109.00
Calcium (mg/dl)	8.92 ± 0.65	9.00
CRP (mg/L)	6.09 ± 7.48	3.01

Table 1. Demographics, etiology, Ranson score, outcomes and laboratory analysis of the patients (continue)		
	n	**%**
White blood cell (10^3/μl)	11.21 ± 5.06	10.08
Hemoglobin (g/dl)	12.60 ± 1.73	12.55
Hematocrit (%)	37.63 ± 4.94	37.40
Platelet (10^3/μl)	252.01 ± 80.96	247.00

AST: Aspartate Aminotransferase, ALT: Alanine Aminotransferase, ALP: Alkalane Phosphatase, GGT: Gamma Glutamyl Transpherase, LDH: Lactate Dehydrogenase, HDL: High Density Lipoprotein, LDL: Low Density Lipoprotein, CRP: C-Reactive Protein.

When patients were compared according to the presence of diabetes mellitus, a significant difference was not found between the groups in length of ward, ICU and total hospital stays and RANSON scores (Table 4). In the comparison of groups with and without ERCP, RANSON score did not show significant difference between the groups, but length of ward, ICU and total hospital stays were detected to be significantly high in the group with ERCP (Table 4).

DISCUSSION

Pancreatitis is one of the most commonly seen disease of the gastroenterological system affecting 13-45 people in 100.000 every year and its incidence increases worldwide (2). Although poor prognosis can be prevented in a majority of the patients through early diagnosis and appropriate treatment, severe morbidity and mortality can be seen in a small amount of patients (3). It frequently develops as a result of obstruction in the pancreatic enzyme flow that occurs due to gallstones-linked blockage of vater ampulla, and alcohol consumption is the second most common reason. It typically presents with abdominal pain, nausea and vomiting. Its clinical diagnosis can be made through elevated serum lipase and amylase activity and the association between the pain clinic and imaging techniques like computed tomography. While interstitial edematous pancreatitis is observed with a rate of 95%, necrotizing pancreatitis is seen in the remaining patient group. It can cause local complications such as pseudocysts and fluid collection or may lead to systemic complications due to sepsis or exacerbation of previous complications (4).

Risk or acute pancreatitis increases with age and varies depending on etiology. In our study, mean age of all patients was 62.99 ± 17.80 years, and 163 (62.69%) were females while 97 (37.31%) were males. While chronic pancreatitis was more commonly seen in male patients, the incidence of acute pancreatitis, apart from etiology, is similar in males and females, but there are studies reporting that it is observed more commonly in males (4,5). However, in our study, female patient group had the higher number of patients with pancreatitis diagnosis. This difference in sex groups supports the opinion that etiology may show regional variation. The proportional relation between gallstones and alcohol consumption, which are the two major reasons of pancreatitis, may vary according to geographical regions. In South European countries where Turkey is also located in, the proportion of gallstones to alcohol is higher when compared to other regions of Europe, and this rate increases (6). On the other hand, alcohol-associated pancreatitis is seen less in Asian countries when compared with the West (5). Compatible with this, while gallstones were seen in 139 (53.46%) patients, alcohol consumption was determined in only three (1.15%) patients. Other reasons of etiological differences found in our study include the high rate of female patients, the fact that gallstone-related pancreatitis is seen more proportionately in this group (7), and the fact that regional sociocultural structure affects alcohol use and dietary habits.

It is known that acute pancreatitis is directly and indirectly involved in some comorbid diseases. Type 2 Diabetes Mellitus (DM) is one of the leading comorbidities in pancreatitis patients and has been shown by some studies to increase the risk of acute pancreatitis 1.5-3 folds. Besides the fact that this risk originates from diabetes itself, it is considered to be in relation to hypertriglyceridemia that develops due to metabolic dysfunction, gallstones or some antidiabetic uses (8). The presence of DM in 50 (19.23%) of the recruited patients supports the opinion that diabetes is a comorbidity related to pancreatitis and frequently seen in patients with pancreatitis. Nonetheless, the fact that there was no difference of ward stays, ICU stays and RANSON scores of pancreatitis patients with and without DM makes us consider that this comorbidity does not materially constitute a difference in terms of outcomes in our patients.

There are several scoring systems for acute pancreatitis and are used widely to predict the severity and mortality of the disease. Glasgow, APACHE II, BISAP, Panc 3 and RANSON criteria are among the most commonly used systems. RANSON scoring is among the most commonly preferred scoring system due to the fact that it has 75-83% sensitivity and 67-81% specifity and reflects the dynamic structure of systemic complications by merging clinical and laboratory parameters

Table 2. Length of hospital stay of etiologic groups and their comparisons according to RANSON score

	Absent		Alcohol		Gallstone		Viral		Lipemia		Postercp		p
	Mean ± S.D.	Median	Mean ± S.D.	Median	Mean ± S.D.	Median	Mean ± S.D.	Median	Mean ± S.D.	Median	Mean ± S.D.	Median	
Length of ward stay (day)	2.43 ± 0.72	2.00	3.00 ± 1.00	3.00	2.55 ± 0.89	2.00	2.00 ± 0.68	2.00	1.75 ± 0.50	2.00	2.00 ± 0.63	2.00	0.227
Length of ICU stay (day)	1.88 1.72	1.00	2.67 ± 1.15	2.00	2.45 ± 1.83	2.00	1.00 ± 0.57	1.00	0.75 ± 0.50	1.00	3.00 ± 0.52	3.00	**0.008**
Length of total hospital stay (day)	4.14 ± 1.91	4.00	5.67 ± 2.08	5.00	4.99 ± 2.25	5.00	3.00 ± 1.12	3.00	2.50 ± 0.58	2.50	5.00 ± 1.72	5.00	**0.002**
Ranson score	0.94 ± 1.07	1.00	2.33 ± 0.58	2.00	1.16 ± 1.04	1.00	2.00 ± 0.69	2.00	0.50 ± 0.58	0.50	1.00 ± 0.87	1.00	0.061

Kruskal Wallis Test.

taken at different times (9). In our study, there was no significant difference between the RANSON scores of patients with different etiologies; however, low RANSON score and only one (0.38%) dying patient show that patients from low-risk group predominated.

In acute pancreatitis patients, in the presence of biliary obstruction and in 30% of patients that could not be diagnosed with non-invasive methods, endoscopic retrograde cholangiopancreatography (ERCP) is one of the diagnostic and primary treatment procedures (10). However, since ERCP itself may cause pancreatitis at a rate between 5-10% and other complications, it is recommended not to be routinely used but considered primarily in the presence of complications like cholangitis (11). While there are studies reporting less complications in patients in whom ERCP has been performed early (12,13) there are also series specifying that there is no difference in severe acute pancreatitis patients with patients not receiving ERCP (14). Apart from difference of opinion on this matter in the literature, 73 (28.08%) patients that had undergone ERCP had significantly longer ward and ICU stays compared to those without ERCP. In the presence of opinions stating that ERCP has limited benefit or even negative effects in mild biliary pancreatitis cases (11), this prolonged hospitalization found in patients undergoing ERCP is challenging in terms of benefit and harm of early ERCP.

CONCLUSION

Acute pancreatitis is a disease with varying etiology endemically and may have differences regarding the preferred scoring system and treatment modality. The fact that it is one of the most commonly seen gastrointestinal diseases in the world and its incidence is increasing each year necessitates this disease to be evaluated with new data and different viewpoints. Thanks to the sharing of clinical experience of different clinics, we believe that a multifaceted currency can be achieved in the diagnosis and treatment of acute pancreatitis.

Table 3. The correlation of CRP, white blood cell count and Ranson score with length of hospital stays

	Length of ward stay (day)		Length of ICU stay (day)		Length of total hospital stay (day)	
	r	p	r	p	r	p
CRP (mg/L)	0.023	0.710	0.205	**0.001**	0.166	**0.007**
White blood cell (10^3/µl)	0.118	0.057	0.232	**<0.001**	0.210	**0.001**
Ranson score	0.217	**<0.001**	0.404	**<0.001**	0.422	**<0.001**

Spearman Correlation Test.
CRP: C-Reactive Protein.

Table 4. Comparison of length of hospital stays with diabetes mellitus, endoscopic retrograde cholangiopancreatography and Ranson score

	Diabetes Mellitus				
	Absent		Present		
	Mean ± S.D.	Median	Mean ± S.D.	Median	p
Length of ward stay (day)	2.45 ± 0.81	2.00	2.66 ± 0.87	2.50	0.131
Length of ICU stay (day)	2.14 ± 1.95	2.00	2.32 ± 1.39	2.00	0.131
Length of total hospital stay (day)	4.50 ± 2.19	4.00	4.98 ± 1.88	5.00	0.052
Ranson score	1.02 ± 1.06	1.00	1.26 ± 1.01	1.00	0.080
	Endoscopic Retrograde Cholangiopancreatography				
	Not performed		Performed		
	Mean ± S.D.	Median	Mean ± S.D.	Median	p
Length of ward stay (day)	2.39 ± 0.80	2.00	2.75 ± 0.83	3.00	**<0.001**
Length of ICU stay (day)	2.04 ± 1.92	2.00	2.52 ± 1.63	3.00	**0.008**
Length of total hospital stay (day)	4.34 ± 2.15	4.00	5.23 ± 1.97	5.00	**<0.001**
Ranson score	1.06 ± 1.09	1.00	1.10 ± 0.96	1.00	0.512

Mann Whitney U Test

REFERENCES

1. Yadav D, Lowenfels AB. Trends in the epidemiology of the first attack of acute pancreatitis: a systematic review. Pancreas 2006;33:323-30.

2. Dick CK, Ashley CR, Paul E. Acute pancreatitis: what's the score? J Emerg Med 2015;48(6):762-70.

3. Eachempati SR, Hydo LJ, Barie PS. Severity scoring for prognostication in patients with severe acute pancreatitis: comparative analysis of the Ranson score and the APACHE III score. Arch Surg 2002;137(6):730-6.

4. Moggia E, Koti R, Belgaumkar AP, Fazio F, Pereira SP, Davidson BR, et al. Pharmacological interventions for acute pancreatitis. Cochrane Database Syst Rev 2017;4(4):CD011384.

5. Dhiraj Y, Albert BL. The epidemiology of pancreatitis and pancreatic cancer. Gastroenterology 2013;144(6):1252-61.

6. Roberts SE, Morrison Rees S, John A, Williams JG, Brown TH, Samuel DG. The incidence and aetiology of acute pancreatitis across Europe. Pancreatology 2017;17(2):155-65.

7. Lankisch PG, Lowenfels AB, Maisonneuve P. What is the risk of alcoholic pancreatitis in heavy drinkers? Pancreas 2002;25:411-2.

8. Lauret E, Rodríguez-Peláez M, Rodrigo Sáez L. (March 4th 2015). Etiology of pancreatitis and risk factors, Acute and Chronic Pancreatitis, Luis Rodrigo, IntechOpen.

9. Guido A, Bettina MR, Ernst K. Scoring of human acute pancreatitis: state of the art. Langenbecks Arch Surg 2013;398:789-97.

10. Hernandez L, Catalano M. Endoscopic techniques (ERCP, EUS) for the evaluation of unexplained acute pancreatitis. Tech Gastrointest Endosc 2004;6:84-90.

11. Tenner S, Baillie J, DeWitt J. American College of Gastroenterology Guideline: Management of Acute Pancreatitis. Am J Gastroenterol 2013;108(9):1400-15.

12. Neoptolemos JP, London NJ, James D, Fossard DP. Controlled trail of urgent endoscopic retrograde cholangiopancreatography and endoscopic sphincterotomy versus conservative management for acute pancreatitis due to gallstones. Lancet 1988;3:979-83.

13. Fan ST, Lai EC, Mok FP, Lo CM, Zheng SS, Wong J. Early treatment of acute biliary pancreatitis by endoscopic papillotomy. New Engl J Med 1993;328(2):28-32.

14. Folsch UR, Nitsche R, Ludtke R, Hilgers RA, Creutzfeldt W. Early ERCP and papillotomy compared with conservative treatment for acute biliary pancreatitis. N Engl J Med 1997;336:237-42.