CLINICAL RESEARCH / KLİNİK ARAŞTIRMA

The Effects of Predictive Factors on Patient Prognosis in the Administration of Medical and Surgical Treatment in Patients with Acute Pancreatitis

Akut Pankreatitli Hastalarda Medikal ve Cerrahi Tedavi Uygulamasında Prediktif Faktörlerin Hasta Prognozu Üzerine Etkileri

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Abstract

Objective: This study aimed to evaluate the effects of predictive factors on prognosis in medical and surgical treatment practices in patients with acute pancreatitis (AP).

Methods: Demographic data, laboratory parameters, co-morbidities, imaging method results, treatment procedures, Ranson Score (RS) and Balthazar Score (BS) of the patients who were diagnosed with AP and followed up and treated between January 2008 and February 2012 were retrospectively analyzed. The patients were divided into two groups as those who underwent medical and surgical treatment, and the effects of predictive factors were evaluated according to the treatment decisions of the patients and their mortality and morbidity during treatment.

Results: Coronary artery disease (n=31) as a co-morbidity in the medical treatment group was found to be statistically significant compared to the surgery group (n=2) (p=0.018). In the comparison of RS and related pancreatitis severity between both groups; In the comparison of severe or mild treatment choice, it was found statistically significant that the cases who underwent surgical treatment had mild severity. A statistically significant difference was found between late RS and morbidity and mortality (p=0.037). It was found that as BS increased, mortality increased significantly (p=0.008). The length of hospital stay was significantly shorter in patients who received medical treatment (p=0.001).

Conclusion: We found that coronary artery disease and length of hospital stay were more common in medically treated AP patients, and surgically treated patients were mildly severe. Additionally, we found that morbidity and mortality were relaeted with the increase in late RS, and mortality was releated with increase in BS.

Keywords: Acute pancreatitis, prognosis, treatment

Öz

Amaç: Bu çalışmanın amacı akut pankreatit (AP) tanılı hastalarda medikal ve cerrahi tedavi uygulamalarında prediktif faktörlerin prognoz üzerine olan etkilerini araştırmaktır.

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Öz

Yöntem: Ocak 2008 - Şubat 2012 tarihleri arasında AP tanısı konularak takip ve tedavi edilen hastaların demografik verileri, laboratuvar parametreleri, yandaş hastalıkları, görüntüleme yöntem sonuçları, uygulanan tedavi prosedürleri, Ranson Skoru (RS) ve Balthazar Skorları (BS) retrospektif olarak incelendi. Hastalar medikal ve cerrahi tedavi uygulananlar olarak iki gruba ayrılarak hastaların tedavi kararı verilmesinde ve tedavi sırasındaki mortalite ve morbiditelerine göre prediktif faktörlerin etkileri incelendi.

Bulgular: Medikal tedavi uygulanan hasta grubunda yandaş hastalık olarak koroner arter hastalığı (n=31) cerrahi uygulanan hasta grubuna göre (n=2) istatistiksel olarak anlamlı saptanmıştır (p=0,018). Her iki grup arasında RS ve buna bağlı belirlenen pankreatit şiddeti karşılaştırmasında; şiddetli veya hafif olmasıyla tedavi seçiminin karşılaştırılmasında cerrahi tedavi uygulanan olguların hafif şiddette olması istatistiksel olarak anlamlı saptandı. Geç RS ile morbidite ve mortalite arasında istatistiksel olarak anlamlı fark saptandı (p=0,037). BS arttıkça mortalitenin arttığı anlamlı olarak bulunmuştur (p=0,008). Medikal tedavi uygulanan hastaların hastanede kalış süresi anlamlı olarak daha kısadır (p=0,001).

Sonuç: Yandaş hastalık olarak koroner arter hastalığınınve hastanede yatış süresinin medikal olarak tedavi edilen AP hastalarında daha sık olduğu, cerrahi olarak tedavi edilen hastaların hafif şiddette olanlar olduğunu saptadık. Bunun yanında geç RS'nin artması ile morbidite ve mortalitenin arttığını, BS arttıkça da mortalitenin arttığını saptadık.

Anahtar Kelimeler: Akut pankreatit, prognoz, tedavi

Introduction

Acute pancreatitis (AP) is still a major cause of mortality and morbidity despite advances in diagnosis and treatment. It shows a wide spectrum in terms of clinical course and can progress with a mortality rate of 20-40% in severe forms[1]. Although the developments in endoscopy, interventional radiology, intensive care and surgical approaches in the last decade have made progress in the diagnosis, treatment and follow-up of cases with severe pancreatitis, there is a consensus that the desired level has not been reached yet.

Because of its high mortality and morbidity rates, scoring systems that provide predictive information about the clinical course of AP have been developed.Through to these scoring systems, it is important for prognosis to have an idea about the course of the disease and to plan the treatment in this way[2].

In this study, we evaluated the effects of predictive factors on prognosis in medical and surgical treatment practices in patients with AP.

Materials and Methods

Patients who were diagnosed with AP and monitored and treated between January 2008 and February 2012 were enrolled. Patients who were referred to our clinic because of complications were excluded from the study. Demographic data, laboratory parameters, co-morbidities, imaging method results, treatment procedures, Ranson Score (RS) and Balthazar Score (BS) were retrospectively analyzed.

Stopping of oral intake, IV fluid therapy, antibiotherapy, analgesic therapy, total parenteral nutrition support according to the hospitalization and morbidity status of the patients were administered as medical therapy.

Our patients were divided into two groups as those who underwent medical and surgical treatment, and the effects of predictive factors were examined according to the treatment decisions of the patients and their mortality and morbidity during treatment.

Due to its retrospective design, an ethical approval was not warranted according to local regulations on clinical research during the time of the study.

Statistical Analysis

The 25th version of the Statistics Package for Social Sciences by International Business Machines Corporation (New York, United States) was used for statistical analysis. Fisher's exact t-test was used for comparing discrete variables and one-way ANOVA was used for continuous variables. Logistic regression was used for multivariate analysis. A p value of less than 0.05 was considered statistically significant.

Results

A total of 195 patients were studied. One hundred and fifteen cases were female (59%) and 80 cases were male (41%). The mean age was calculated as 63 (21-91).

Diabetes mellitus in 35 cases (17.9%), hypertension in 78 cases (40%), coronary artery disease (CAD) in 33 cases (16.9%), hyperlipidemia in 7 cases (3.6%), and chronic obstructive pulmonary disease in 7 cases (3.6%), cerebrovascular disease in 8 cases (4.1%), chronic renal failure in 1 case (0.5%) were detected as co-morbidites.

Biliary causes in 133 cases (68.2%), alcohol use in 3 cases (1.5%), hyperlipidemia in 3 cases (1.5%), hypercalcemia in 3 cases (1.5%), and 1 case (0.5%) pancreas divisum was detected as pancreatitis etiology. Fifty two cases (26.7%) were evaluated as idiopathic.

The patients were divided into two groups as those who underwent surgical and medical treatment. Surgical treatment was performed on 42 patients (21.5%), and medical treatment was performed on 153 patients (78.5%). There was no statistical difference between the patients in both groups in terms of age and gender (Table 1).

Our surgical treatment was cholecystectomy in 36 cases, cholecystectomy + T-tube drainage in 2 cases, cholecystectomy + hepaticojejunostomy in 1 case, pseudocyst drainage in 1 case, debridement in 1 case, and explorative laparotomy in 1 case.

CAD (n=31) as a co-morbidity in the medical treatment group was found to be statistically significant compared to the surgery group (n=2) (p=0.018).

The RS and related pancreatitis severity were compared between both groups. When we compared the choice of treatment in terms of severe (RS≥3) or mild (RS<2) RS, it was found statistically significant differences that the patients who underwent surgical treatment had mild severity. When we compared the morbidity and mortality rates with early (at admission) and late (in 48 h), total RSs, a statistically significant difference was found between late RS and morbidity and mortality (p=0.037). The morbidity and mortality rates increased as late RS increased. No statistically significant difference between the two groups in the comparison of computed tomography (CT) findings and treatment options in the Balthazar classification. However, when CT findings and the presence of morbidity and mortality were compared in the Balthazar classification, it was found that mortality increased as BS increased (p=0.008).

While the average length of stay in the hospital was 13.12 days in patients who underwent surgical treatment, it was 7.71 days in patients who received medical treatment, and the hospital stay was statistically significantly shorter in patients who received medical treatment (p=0.001) (Tables 2, 3).

Discussion

AP is a reversible inflammatory disease of the pancreas. Although it can be seen at any age, it peaks between the ages of 60-70 years, and the most common causes in etiology are gallstones, alcoholism, and idiopathic[3]. In terms of age and ethology, the results of our study were similar to those the literature.

Imaging methods are more valid than laboratory parameters in the diagnosis of AP. CT is the most sensitive radiological method and 90-95% of the pathologies of AP can be shown. With CT, it is possible to detect important findings such as pancreatic necrosis, peripancreatic inflammatory changes, fluid collection, pancreatic hemorrhage and necrosis. In a series of 118 patients, the diagnostic sensitivity and specificity of CT were found to be 53% and 90% in mild AP cases; these rates were found to be 100% and 61%, respectively, in severe AP cases in the same series[4]. In the Balthazar classification, its relation with mortality was established by combining the degree of CT findings and the rate of necrosis[5]. Another scoring system used to evaluate the prognosis in AP is the Ranson criteria and the RS calculated accordingly[6]. Leung et al.[7] compared BSs with Ranson and APACHE II scores in a series of 121 patients. They reported that the Balthazar scoring system was more sensitive in predicting the mortality of AP and the duration of hospitalization of patients with AP[7]. Similarly, Takeda et al.[8] also reported that the Balthazar scoring system was higher in predicting the prognosis than the Ranson and APACHE II scoring systems. In another study, the BS was compared with the APACHE II score and the level of C-reactive protein, a serum parameter, and it was reported that the Balthazar scoring system was much more effective than other parameters in staging the severity of the disease in patients with AP[9]. In our study, it was seen that medical treatment was preferred in patients with severe pancreatitis according to the Ranson criteria. There was no statistically significant difference in the choice of treatment according to Balthazar CT classification. However, mortality and morbidity were positively correlated with the score of late RS and Balthazar CT classification.

Study Limitations

The limitations of this study are the small number of cases and the retrospective method.

Conclusion

In conclusion; we think that CAD and length of hospital stay are more common in AP patients treated medically, and patients treated surgically are those with mild severity. However, we found that morbidity and mortality were related with the increase in late RS, and mortality was related with the increase in BS.

Table 1. Comparison of gender, etiology, Ranson Scores, pancreatitis severity, hospitalization day, and CT findings of patients who underwent medical treatment and surgical treatment			
	Medical treatment (n=153)	Surgical treatment (n=42)	p-value
Age, mean±SD	63.56±16.38	59.90±15.39	0.196
Gender			0.640
Female	85	30	
Male	68	12	
Co-morbidity			
Diabetes mellitus	29	6	0.485
Hypertension	61	17	0.943
Coronary artery disease	31	2	**0.018**
Hyperlipidemia	5	2	0.645
COPD	7	0	0.350
Cerebro vascular disease	8	0	0.205
Chronic renal failure	1	0	1.000
Etiology			
Idiopathic	51	1	
Biliary	92	41	
Alcohol	3	0	
Hyperlipidemia	3	0	
Hypercalcemia	1	0	
Pancreas divisum	1	0	
Ranson Score at admission			**0.001**
0	33	20	
1	64	15	
2	46	6	
3	10	1	
4	0	0	
5	0	0	
Ranson Score in 48 hour			**0.012**
0	54	24	
1	77	15	
2	21	2	
3	1	1	
4	0	0	
5	0	0	
6	0	0	
Total Ranson Score			**<0.001**
0	16	13	
1	34	12	
2	54	13	
3	34	3	
4	11	0	

Table 1. Continued			
	Medical treatment (n=153)	Surgical treatment (n=42)	p-value
5	4	1	
Pancreatitis severity			**0.003**
Mild	104	38	
Severe	49	4	
Amylase value (U/L), mean±SD	1886.20±1470.30	1904.43±1379.76	0.941
CT findings (Balthazar Score)			0.465
Normal (0)	53	17	
Focal or diffuse enlargement of the pancreas (1)	28	7	
Peripancreatic inflammation (2)	42	11	
Single site fluid accumulation (3)	15	5	
Two or more foci of fluid accumulation adjacent to the pancreas and/or the presence of gas in or around the pancreas (4)	15	2	
No necrosis (0)	152	40	
Less than 30% necrosis (2)	0	0	
30-50% necrosis (4)	0	1	
More than 50% necrosis (6)	2	1	
Hospitalization (day), mean±SD	7.71±3.79	13.12±9.30	**0.001**
Morbidity	17	9	0.080
Mortality	1	2	0.055
COPD: Chronic obstructive pulmonary disease, CT: Computed tomography, SD: Standard deviation			

Table 2. Differences between two groups in terms of gender, age, Ranson Scores, amylase value, pancreatitis severity, etiology, hospitalization day, CT findings and comorbidities			
	Morbidity	Non-morbidity	p-value
	n=26	n=169	
Gender, n			
Female	17	98	0.475
Male	9	71	
Age, mean±SD	66.31±13.17	62.23±16.59	0.233
Ranson Score at admission, n			
0	5	48	
1	13	66	
2	6	46	0.616
3	2	9	
4	0	0	
5	0	0	
Ranson Score in 48 hour n			
0	7	71	
1	12	80	
2	6	17	
3	1	1	**0.037**
4	0	0	
5	0	0	
6	0	0	

Table 2. Continued			
	Morbidity	**Non-morbidity**	**p-value**
	n=26	**n=169**	
Total Ranson Score, n			
0	3	26	
1	3	43	
2	11	56	
3	6	31	0.124
4	0	11	
5	3	2	
6	0	0	
Amylase value (N=0-100 U/L)			
>100 U/L	25	163	1.000
>1000 U/L	20	113	0.305
Pancreatitis severity, n			
Mild (RS≤2)	17	125	0.36
Severe (RS≥3)	9	44	
Etiology			
Idiopathic	4	48	
Biliary	22	111	
Alcohol	0	3	
Hyperlipidemia	0	3	
Hypercalcemia	0	3	
Pancreas divisum	0	1	
CT findings, n (Balthazar Score)			
Normal (0)	8	62	
Focal or diffuse enlargement of the pancreas (1)	6	29	
Peripancreatic inflammation (2) Single site fluid accumulation (3)	6	47	0.584
Two or more foci of fluid accumulation adjacent to the pancreas and/or the presence of gas in or around the pancreas (4)	2	18	
	4	13	
Co-morbidity, n			
Diabetes mellitus	5	30	0.789
Hypertension	11	67	0.796
Coronary artery disease	3	30	0.579
Hyperlipidemia	1	6	1.000
COPD	1	6	1.000
Cerebro vascular disease	2	6	0.289
Chronic renal failure	0	1	1.000
Hospitalization (day), mean±SD	12.27±11,578	8.35±4,229	0.099
COPD: Chronic obstructive pulmonary disease, CT: Computed tomography, SD: Standard deviation, RS: Ranson Score			

Table 3. Differences between two groups in term of gender, age, Ranson Scores, amylase value, pancreatitis severity, etiology, hospitalization day, CT findings and comorbidities			
	Mortality n=3	Non-mortality n=192	p-value
Age, mean±SD	70.67±18.00	62.65±16.99	0.522
Ranson Score at admission, n			
0	1	52	0.374
1	0	79	
2	1	51	
3	1	10	
4	0	0	
5	0	0	
Ranson Score in 48 hour, n			
0	0	78	**0.028**
1	1	91	
2	2	21	
3	0	2	
4	0	0	
5	0	0	
6	0	0	
Total Ranson Score, n			
0	0	29	0.072
1	0	46	
2	1	66	
3	1	36	
4	0	11	
5	1	4	
6	0	0	
Amylase value (N=0-100 U/L)			
>100 U/L	3	185	1.000
>1000 U/L	3	130	0.553
Pancreatitis severity, n			
Mild (RS≤2)	2	51	0.180
Severe (RS≥3)	1	141	
Etiology			
Idiopathic	1	51	
Biliary	2	131	
Alcohol	0	3	
Hyperlipidemia	0	3	
Hypercalcemia	0	3	
Pancreas divisum	0	1	
CT findings, n (Balthazar Score)			

Table 3. Differences between two groups in term of gender, age, Ranson Scores, amylase value, pancreatitis severity, etiology, hospitalization day, CT findings and comorbidities

	Mortality n=3	Non-mortality n=192	p-value
Normal (0)	0	70	
Focal or diffuse enlargement of the pancreas (1)	0	35	
Peripancreatic inflammation (2)	0	53	**0.008**
Single site fluid accumulation (3)	1	19	
Two or more foci of fluid accumulation adjacent to the pancreas and/or the presence of gas in or around the pancreas (4)	2	15	
Co-morbidity, n			
Diabetes mellitus	0	35	1.000
Hypertension	1	77	1.000
Coronary artery disease	0	33	1.000
Hyperlipidemia	0	7	1.000
COPD	0	7	1.000
Cerebrovascular disease	0	8	1.000
Chronic renal failure	0	1	1.000
Hospitalization (day), mean±SD	26.00±31,000	8.60±4,521	0.434
COPD: Chronic obstructive pulmonary disease, CT: Computed tomography, SD: Standard deviation, RS: Ranson Score			

Ethics

Ethics Committee Approval: Since the study was a retrospective, regular file scanning-based study, and it was before 2020, an ethics committee approval form was not obtained.

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: K.T., M.Ü., M.Y., C.K., Design: K.T., M.Ü., M.Y., C.K., Data Collection or Processing: K.T., M.Ü., M.Y., C.K., Analysis or Interpretation: K.T., M.Ü., M.Y., C.K., Literature Search: K.T., M.Ü., M.Y., C.K., Writing: K.T., M.Ü., M.Y., C.K.

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