

## Evaluation of Acute Pancreatitis Etiology and Prognosis: Our Results of Ten Years-Retrospective Study

Mehmet Aykut YILDIRIM<sup>1</sup>

**Abstract:** Our objective was to evaluate the etiology and clinical results of acute pancreatitis patients treated in our clinic. Material and Method 395 AP patients were included in the study. AP patients were grouped as MAP, MSP and SAP according to the revised Atlanta classification. Etiology, demographic data hospital and intensive care unit hospitalization were recorded for all patients. Body mass index (BMI), amylase, lipase, hematocrit, C-reactive protein (CRP), procalcitonin, liver function tests and arterial blood gas analyses were made during diagnosis. Systemic Inflammatory Response Findings (SIRS) were evaluated in respiratory, cardiovascular and nephrological terms according to modified Marshall scoring (MMS) system. Necrosis degree was detected based on CT Severity Index (CTSI). Pancreatitis severity was clinically determined based on Imrie score. There were 395 patients in total. 55.6 of the patients were male (n:220) and 44.4% (n:175) were female. The average age was 54.2 (18-84). Biliary pancreatitis was observed most commonly among AP causes. Hypertriglyceridemia was the second most common cause. Its mortality rate among all patients was 4.05%. As a result, gallstones constitute the most common etiological factor in AP. Increasing of nutrition habits with fatty foods increase hypertriglyceridemic AP.

**Keywords:** Acute pancreatitis, gall stone, hypertriglyceridemia, etiology.

**Özet:** Kliniğimizde tedavi edilen akut pankreatitli hastaların etyoloji ve klinik sonuçları açısından değerlendirmeyi amaçladık. Çalışmada 395 AP'li hasta mevcuttu. AP'li hastalar revize Atlanta sınıflamasına göre MAP, MSP ve SAP olarak gruplandı. Tüm hastaların etyolojisi, demografik verileri, hastanede ve yoğun bakımda yatış süreleri kaydedildi. Vücut kitle indeksi(BMI), tanı anındaki amilaz, lipaz, hematokrit, C- reaktif protein(CRP), prokalsitonin, karaciğer fonksiyon testleri, arteriyel kan gazı analizleri yapıldı. Sistemik İnflamatuvar Cevap Bulguları(SIRS), modifiye Marshall skorlama(MMS) sistemine göre solunumsal, kardiyovasküler ve nefrolojik açıdan organ yetmezlikleri değerlendirildi. CT severity Index'e (CTSI) göre nekroz derecesi tespit edildi. Klinik olarak İmrie skoruna göre pankreatit şiddeti belirlendi. Toplamda 395 hasta vardı. Hastaların % 55,6'sı (n:220) erkek, %44,4'ü (n:175) kadındı. Ortalama yaş 54,2 (18-84) idi. AP'nin nedenleri arasında en fazla biliyer pankreatit görüldü. 2. Sıklıkta hipertrigliseridemi görüldü. Tüm hastalar içerisinde %4,05'lik mortalite oram vardı. Sonuç olarak AP' de en sık etyolojik faktör safra taşlarıdır. Yağlı gıdalarla beslenme alışkanlıklarının artması hipertrigliseridemik AP'yi artırmaktadır..

**Anahtar Kelimeler:** Akut pankreatit, safra taşı, hipertrigliseridemi, etyoloji.

### OBJECTIVE

Acute pancreatitis (AP) is an inflammatory disease of pancreas. AP can be seen in a wide clinical perspective ranging between pathologically mild edematous changes and severe necrotizing pancreatitis. It is separated into three groups as mild, moderate and severe Most of the patients have a mild course. Although it had a mild course in most of the patients, they can also be seen as a severe and complicated disease accompanied by necrosis with a ratio of 10-20%. Its mortality and morbidity is high despite the latest technological developments (1,2).

Long intensive care treatments may be necessary in patients in severe condition since AP causes failures in multiple systems. This situation causes severe costs for the countries. Risk factors should be

<sup>1</sup> Necmettin Erbakan University, Meram Medical Faculty, Department of General Surgery, Konya/TURKEY, drmayildirim@hotmail.com

determined and the scoring should be made for efficient treatments in the early period of the disease and the clinical management should be applied effectively (3-5).

While AP occurs generally due to biliary tract stone, alcoholic pancreatitis is also commonly seen in western societies. Idiopathic AP also occurs due to ERCP complication, pancreas cancer, hyperlipidemia and hypercalcemia and trauma (3, 6, 7). Risk factors, disease etiology, early diagnosis and treatment affect prognosis. Based on the results of the patients treated in our clinic, our objective was to evaluate AP which has an important place among acute stomach causes in our country.

### **MATERIAL and METHOD**

Patients treated due to acute pancreatitis diagnosis in Necmettin Erbakan University Meram Faculty of Medicine General Surgery Clinic between 2010 and 2020 were retrospectively evaluated in this study. Consent of the ethics board was taken. 395 AP patients were included in the study. AP patients were grouped as Mild AP (MAP), moderately severe AP (MAP) and severe AP (SAP) based on revised Atlanta classification (8). NP patients were separated into three groups based on necrosis ratios in CTSI.

Patients detected to have high serum amylase and lipase together with the characteristic pain of AP, were diagnosed with acute pancreatitis diagnosis according to revised Atlanta criteria and have pancreatitis finding in intravenous contrasted abdominal tomography were included. In the first evaluation, the patients who had pancreatic or peripancreatic inflammation findings but no local complication and organ failure were classified as interstitial edematous pancreatitis (IEP) patients and patients who have necrosis findings in pancreatic or peripancreatic zones but lacked contrast involvement were classified as NP patients (8). Patients with chronic pancreatitis were not included in the study. Based on revised Atlanta criteria, the patients detected not to have local complication and organ failure were classified as patients with mild AP (MAP), NP patients who didn't have organ failure or those who had temporary organ failure but recovered in 48 hours were classified as moderately severe AP (MSP) and the organ failures continuing after 48 hours were regarded as permanent and these patients were classified as severe AP (SAP) patients (9).

Etiology, demographic data hospital and intensive care unit hospitalization were recorded for all patients. Body mass index (BMI), amylase, lipase, hematocrit, C-reactive protein (CRP), procalcitonin, liver function tests and arterial blood gas analyses were made during diagnosis. Systemic Inflammatory Response Findings (SIRS) were evaluated in respiratory, cardiovascular and nephrological terms according to modified Marshall scoring (MMS) system. Necrosis degree was determined based on CT Severity Index (CTSI) (23). Pancreatitis severity was clinically determined based on Imrie score. Modified Marshall Score  $\geq 2$  was accepted as organ failure (10). WBC, body temperature, pulse and respiratory rate parameters were evaluated for SIRS and values  $\geq 3$  were accepted as SIRS (11).

All data were statistically analyzed. Descriptive statistics was performed using Jamovi software program.

### **RESULTS**

There were 395 patients in total. 55.6% (n:220) of the patients were male and 44.4% (n:175) were female. Mean age of the patients was 54.2 (18-84).

Biliary pancreatitis was observed most commonly among AP causes. 255 of the patients (63.2%) had biliary tract stone related AP. Among other patients, 6.3% (n:25) had alcoholic pancreatitis, 10.1% (n:40) had hypertriglyceridemia, 15.7% (n:62) had idiopathic, 2.4% (n: 9) post-ERCP and 1% (n:4) had hypercalcemia related AP (Table 1).

<b>Etiology</b>	<b>n</b>	<b>%</b>
gall stone	255	63,2
hypertriglyceridemia	40	10,1
alcohol use	25	6,3
post-ERCP	9	2,4
hypercalcemia	4	1
idiopatik	62	15,7

*Table 1. Acute pancreatitis etiology*

Most AP patients had MAP and MSAP. 10% (n:40) had SAP.

Hypertension and diabetes mellitus were the most common comorbid diseases in AP patients. 18.9% of the patients had DM and Hypertension. Intra-abdominal free fluid was the most common complication with the rate of 13.9%r in AP patients (n:55). %12.2% (n:48) had pancreatic necrosis, 8.1% (n:32) had pancreatic pseudocyst and 5.1% (n: 20) had peritonitis.

6.8% (n: 27) of the patients had systemic inflammatory response syndrome (SIRS) and 4.1% (n:16) had multiple organ dysfunction syndrome (MODS).

16.5% (n:65) were treated in intensive care unit. Median intensive care unit hospitalization duration was nine days. 4.05% of the patients (n: 16) died. All of these patients had SAP. 12 patients had necrotizing pancreatitis. The average age of these patients was >65. Among the patients who died, 10 were male and 6 were female. MODS, septic shock and acute respiratory failure were the most common death causes in these patients. In the etiology of the SAP patients who died, six patients had gall stone, five patients had hypertriglyceridemia, two patients had hyperglycemia and one patient died after ERCP. No etiology was found in two patients.

## DISCUSSION

AP constitutes a significant place among the emergencies causing stomach ache. Its global yearly prevalence is 40-50 per 100.000 individuals (12, 13). AP related mortality rate is between 5-30% in literature. Mortality continues despite improving intensive care conditions and treatment chances (13).

The most important step in AP treatment is its regulation based on etiology. Routine intravenous fluid treatment, dietary regulation, analgesic treatment, treatment of inflammatory mediator inhibitors and antibiotics constitutes the main constituents of the treatment (14). Older age clinically affects the disease course negatively. Age border changes between 55 and 75 in most studies. As far as we know, age over 75 highly increases mortality rate (15). Although a higher rate of AP formation was reported in males in literature, most reports emphasized no difference in terms of gender (12, 16). Mortality rate in elder patients in our study was found similar to previous studies in terms of age and gender.

BMI>30 also presents a significant risk factor for AP. In a meta-analysis study, SAP rate was 1.8-4.6%, systemic complications were 1.4-3.8%, local complications were 2.4-6.6% and the mortality rate was 1-4.8%. Early and late term organ failures constitute a significant mortality marker and lengthen hospitalization duration. A mortality rate of 42% was reported in the organ failures and necrosis formation within the first 72 hours. These studies emphasized

organ failure as the most important factor determining mortality and morbidity (17). Organ failures significantly influenced the disease progress in our study, too. MODS and death rate were observed high in necrosis cases.

Gall stone is the most commonly known cause of AP. In addition, alcohol and hypertriglyceridemia are among the most common etiological factors after gall stone (18, 19). The significant role of hypertriglyceridemia in AP etiology was observed in AP etiology in recent years. A study emphasized that it is more common than alcoholic AP (14). Considerable hypertriglyceridemia was also reported in SAP patients (14, 15). As the reference hospital in our region, the most common AP cause was again gall stone in our study. Hypertriglyceridemia was the second most common. Our findings for SAP patients in hyperglyceridemia etiology were also in line with literature.

Idiopathic AP has a prevalence of 16.7-23% in literature. The rate was 15.7% in our study (14). We acquired this rate with minimal decrease according to literature. Using methods such as USG, MRCP and ERCP, we think that we may have better clarified some conditions which are hard to diagnose. Similar studies (14) also provided same results with our study.

In recent years, some researchers claimed that AP could be more complicated in some coexisting problems such as high-fat diet, unhealthy life style, smoking, metabolic syndrome and type2 DM (20). Thus it was suggested to consider that patients with multiple risk factors might also have etiological causes (14).

Mortality rate in AP was stated as 1.2-1.5% in many studies. But mortality rate was stated to increase up to 35% in the patients with permanent organ failure (17, 21). Necrosis formation is the local complication of the disease in AP and it exacerbates AP. Parallel to this, studies in literature reported that the presence of necrosis negatively affects prognosis and increases morbidity and mortality rate. While mortality was stated as 23% in any necrosis ratio, it was stated as 0% in conditions without necrosis in some studies. There was a strong relationship between mortality and morbidity in necrosis rates over 30%. But presence of necrosis always brings organ failure along as AP-related inflammatory response may change individually (22-24). Our mortality rate was found as 4.05% among all pancreatitis in our study. This rate was higher than literature. Most of the patients with mortality had organ failure and necrosis. Our higher rate of following the local complications of AP as surgery clinic explains why this rate is higher than all AP rates.

In line with literature, NP patients without organ failure were also present in our study. In parallel, 12 patients (24%) in NP group died due to multi organ failure.

## CONCLUSION

As a result, AP is a disease which mostly has a mild course. Gallstones constitute the most common etiological factor in AP. Increasing of nutrition habits with fatty foods increase hypertriglyceridemic AP. Hypertriglyceridemic etiology may be observed in SAP.

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