

## The Relationship Between Etiology of Acute Pancreatitis and Its Clinical Features in Iranian Patients

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### ABSTRACT

Etiology, clinical course and early diagnosis of acute pancreatitis because of high mortality in severe cases and the increasing rate of incidence in recent years are of important value. Therefore, the present study is conducted for evaluation of correlation between etiology of acute pancreatitis and its clinical course in hospitalized patients in Ahvaz of Iran. This descriptive retrograde study was conducted on patients with acute pancreatitis hospitalized in Ahvaz Imam Khomeini Hospital during 2009-2014. The data of patients including the reason of acute pancreatitis, duration of hospitalization, type of treatment and Ranson score and BISAP score according to existing signs in the profile. In this study, the profiles of 231 patients were evaluated, among which 143 patients were women (61.9%) with average age of 44.95± 19.91 years and 88 patients were men (38.1%) with average age of 46.23± 18.78 years. Idiopathic reasons and then presence of gall bladder stones were the most common reasons of acute pancreatitis. Averagely, the duration of hospitalization of patients with acute pancreatitis was 7.46± 5.4 days. BISAP score and Ranson score in patients were 0.7±0.87 and 0.98±0.92, respectively. The harvested results of the present study showed that criteria such as Ranson and BISAP, are appropriate anticipants for clinical course of patients with acute pancreatitis. Furthermore, because of worse clinical course in patients with acute pancreatitis due to idiopathic reasons, this group is under higher attention.

**Keywords:** etiology, acute pancreatitis, clinical course.

### INTRODUCTION

Acute pancreatitis is an acute inflammation of pancreas which can vary from limit of mild, intermediate and severe pancreatitis with pancreas necrosis and organ failure. Acute pancreatitis generally develops rapidly and its mild type is more common which is curable with supportive treatments such as lack of oral feeding and fluid therapy, but in some cases the disease is severe and despite curing, the patient needs to be cared in ICU and performing surgery. In such cases, high mortality is expected for patients<sup>1-3</sup>. The incidence rate of this

disease in USA is 18 cases in each 100000 people and in Europe is increasingly developing and is 15.9 in 100000 people<sup>4</sup>.

In 2005, at the USA, over 230000 patients with pancreatitis were hospitalized in Hospitals<sup>5</sup>. Recent evaluations have indicated the increasing rate of acute pancreatitis incidence comparing to the past<sup>6</sup>. Increasing of acute pancreatitis catching might be due to increasing rate of obesity, a risk factor for creating gall bladder stones, and thereupon increasing of pancreatitis caused by gall bladder stones<sup>7</sup>. Among various reasons of incidence of

this disease, hypertriglyceridemia and hyperthermia, ERCP and consuming of some drugs can be mentioned <sup>8</sup>.

Acute pancreatitis forces a high cost for health care and follows high physiologic stress for patients. A recent study has shown that the mean cost of hospitalization of acute pancreatitis patients is 9870 dollars. Also, annually 2.2 billion dollars are spent for acute pancreatitis <sup>9, 10</sup>.

With regards to increasing incidence rate of acute pancreatitis, the potential risks caused by it and also deficiency of written studies about this disease in our country, the necessity of a study for evaluating the reasons and clinical course of acute pancreatitis is more felt as a step in more recognition of this disease. Therefore, the present study was purposed for evaluating the etiological correlation of acute pancreatitis and its clinical course.

## METHOD

The present study is a cross-sectional descriptive retrospective study performed by the aim of evaluation of acute pancreatitis reasons and clinical course. In this study, 280 profiles of patients hospitalized due to acute pancreatitis in Ahwaz Imam Khomeini Hospital during years 2008-2014 were evaluated. Firstly, data about patients including age, gender, days of hospitalization, hospitalization in ICU, blood and other blood products receiving, performing a surgery, drug therapy, death, positivity or negativity of SIRS of the patient, BISAP score <sup>11</sup>, Ranson score <sup>3</sup>, etiology of pancreatitis were extracted from patients profiles and were recorded.

According to existing data available in profile, the patients were classified in 7 groups with etiology of gall bladder, alcohol, drug, hyperglyceridemia (triglyceride >200), hypercalcemia (calcium >10.5), pancreatitis following ERCP and idiopathic. It should be noted that those patients with multi reasons for etiology, were placed in group with higher proportionality with the patient clinic according to physician diagnosis and available data in the profile.

### Statistical analysis

SPSS software was used for performing statistical analysis. T-test assay was used in this

survey for evaluating meaningfulness. Also, ANOVA test was applied for evaluating the differences between mean ranges of variables. For performing statistical exams, firstly all data was evaluated for normal distribution and homogeneity of variances. Normality of data was evaluated with Kolmogorov-Smirnov test and homogeneity of variances was evaluated with Leven test. Also, for evaluating the relations, Multyvariate Regression assay was used.

## RESULTS

In this study, the profiles of 231 patients were evaluated, among which 143 patients were women (61.9%) with average age of 44.95± 19.91 years and 88 patients were men (38.1%) with average age of 46.23± 18.78 years (figure 2-3). Also, there was no significant statistical differences between prevalence of acute pancreatitis in different genders ( $P>0.05$ ). Also, the age group of 30-39 years showed the most prevalence of acute pancreatitis with 48 cases and the age group of 80-89 years showed the least prevalence of this disease with 14 cases. There was no significant differences between age of patients with acute pancreatitis in different genders ( $p>0.05$ ).

### Etiology, duration of hospitalization, treatment and clinical pathway

The most prevalent reason of acute pancreatitis are idiopathic (135 patients) and then gall bladder stones (66patients). There was no significant statistical difference between reason of acute pancreatitis in different ages and genders ( $p>0.05$ ). The mean of hospitalization days in the patients was 7.46±5.40 days. Also, according to days of hospitalization, the most frequency was related to 4-5 days group with 29% of subjects and the least one was related to 8-10 days group with 12% of subjects. There was no significant statistical correlation between days of hospitalization and etiology of acute pancreatitis ( $P>0.05$ ). The most frequent therapeutic measure for the patients were drug therapy, blood and blood products transfusion and surgery, respectively. The results showed that there is no significant correlation between disease etiology and type of selected treatment for patients ( $P>0.05$ ) (Table 2). 10 patients have died despite necessary therapeutic and supportive measures.

**Ranson and BISAP Score**

The mean scores of BISAP and Ranson between patients were  $0.7 \pm 0.87$  and  $0.98 \pm 0.92$ , respectively. Also, in 53(22.9%) patients, SIRS was positive. The mean BISAP Score in acute pancreatitis because of gall bladder stones was  $0.25 \pm 0.5$  and  $0.7 \pm 0.8$  in pancreatitis because

of non-gall bladder stone reasons which showed significant difference. Also, the mean of Ranson Score in acute pancreatitis because of gall bladder stones was  $0.9 \pm 0.7$  and  $0.9 \pm 0.9$  in pancreatitis because of non-gall bladder stones reason which there was no significant difference in this case. The mean BISAP Score in acute pancreatitis because of alcohol was  $0.7 \pm 0.9$  and  $0.6 \pm 0.8$  in non-alcohol reason pancreatitis that did not show significant difference. Also the mean Ranson Score in acute pancreatitis because of alcohol was  $1.1 \pm 1$  and  $0.9 \pm 0.8$  in pancreatitis because of non-alcohol reason which there was no significant difference in this aspect.

**Table 1: The comparison of frequency of patients with acute pancreatitis separated for gender in different age groups**

Age groups	Male	Female
19-Oct	5	12
20-29	16	23
30-39	18	30
40-49	10	22
50-59	18	20
60-69	6	11
70-79	9	17
>80	6	8

The results showed that there was no significant difference between BISAP Score and Ranson Score with causing etiology of acute pancreatitis and also the duration of hospitalization ( $p > 0.05$ ). But there was a significant statistical correlation between mean BISAP Score and Ranson Score with blood and blood products transfusion, mortality of patients ( $p > 0.05$ ).

**Table 2: Etiology, duration of hospitalization, treatment and clinical pathway**

Variables		Number (%)	
Etiology	Gallbladder stones	66 (28.57%)	
	Alcohol	3 (1.30%)	
	Idiopathic	135 (58.44%)	
	Hypertriglyceridemia	4 (1.73%)	
	Hypercalcemia	3 (1.30%)	
	Post-ERCP pancreatitis	20 (8.66%)	
Stay in hospital	< 4 days	40 (17.32%)	
	4-5 days	67 (29%)	
	6-7 days	55 (23.8%)	
	8-10 days	28 (12.12%)	
Treatment	>10 days	41 (17.75%)	
	Surgery	Yes	13 (5.63%)
		No	218 (94.37%)
	Blood and blood products transfusion	Yes	31 (13.42%)
	No	200 (86.58%)	
Complications	Drug therapy	Yes	183 (79.22%)
		No	48 (20.78%)
	Necrosis		12 (19.67%)
	Ascites		43 (70.49%)
	Pseudoascites		6 (9.84%)

## DISCUSSION

The results of the present study showed that the number of suffering women from pancreatitis is higher comparing with the number of men, as 61.9% of patients suffering from acute pancreatitis were women and 38.1% were men, although there was no significant difference between prevalence of acute pancreatitis and gender ( $p > 0.05$ ). also the average age of patients suffering from acute pancreatitis was  $45.44 \pm 19.85$  years and the age group of 30-39 years with 48 cases showed the most number of ill subjects. The results of Fateh et al study (2012) showed that 36.5% of patients with acute pancreatitis are men and 63.5% are women. the ratio of woman to man was 1.73 and the mean age was reported 61.06 years<sup>12</sup>. Also, the study of baghi and Mohammadzadeh (2005) showed that 61% of patients suffering from acute pancreatitis were women and 39% were men. The woman to man ratio was 1.59. also, the most common age prevalence was related to age group of 41-50 years old<sup>13</sup>. Barreto et al (2011) in Australia with evaluation of incidence, manifestations and clinical course of acute pancreatitis showed that this disease is more common between middle-aged women<sup>14</sup>. On the other hand, study of Gompertz et al. showed that patients with acute pancreatitis had mean age of 46.5 years, male and female were 55.5% and 44.5%, respectively (54). Li et al. (2004) in their study in China reported that the average age of patients with acute pancreatitis is 43.3 years<sup>15</sup>. The average age of patients suffering from acute pancreatitis in Gullo et al study (2002) in Hospitals of 5 European countries was reported 52.8 years<sup>16</sup>. These results were consistent with results of our study. The higher number of women comparing to men in this study and similar studies can be ascribed to more vulnerability of women to this disease. Generally, the age period higher than 30 years had been included the most number of patients in the majority of evaluations. The difference between average ages of 30 to 60 years in patients suffering from acute pancreatitis in various studies can be attributed to difference in society under study.

In the present study, 15.5% of subjects had the history of diabetes, 12.1% had the history of hyperlipidemia, 16.4% had the history of blood pressure, 9.9% cardiovascular diseases, 8.2% acute

pancreatitis 12.5% performance of ERCP, 11.6% recent surgery, 10.3% smoking, 7.7% narcotics consumption, 1.7% alcohol consuming, 51.9% drug consumption and 1.7% had familial history of having acute pancreatitis. Most consumed drugs were routine drugs applied for cardiovascular, blood pressure, diabetes, calmativ and etc.

The results of various studies especially in Iran have showed that the most common known reason of acute pancreatitis is gall bladder stones<sup>13, 17, 18</sup>. According to findings of the present study, the most prevalent reason of acute pancreatitis were idiopathic (58.44%) and then gall bladder stones (28.57%) and pancreatitis following ERCP (8.66%), pancreatitis caused by alcohol consuming (1.3%), pancreatitis because of hyper triglyceridemia and hypercalcemia (2.01%).

The results of Baghi et al. study showed that 41% of cases of acute pancreatitis were caused by gall bladder stones and 3.1% had alcohol reasons. Also, there was no distinct reason found for 49% of cases in profiles. Furthermore, 13.29% deaths were also reported<sup>13</sup>.

In the present study, the most frequent known reason of acute pancreatitis was idiopathic which is different comparing with USA and many other European countries. Barreto et al. (2011) showed that in the reason of acute pancreatitis was alcohol or with bladder reasons in 80.8% of patients and only 3.4% of acute pancreatitis patients catch it because of drug. These drugs were: codeine, azatioperine, clortiazid, olperic acid, estradiol and rosastatin<sup>14</sup>. Also, in study of Baig et al. (2011) the etiologic range of mild pancreatitis included alcoholism (41.1%), gall bladder stones (23.5%), trauma (17.6%), idiopathic (11.7%) and post endoscopic retrograde collangiopancreatography (5.8%)<sup>19</sup>.

Gullo et al. (2002) showed in evaluation of reason of acute pancreatitis in five European countries showed that colea litiasis (37.1%) and alcohol (41%) were the most etiologic factors<sup>16</sup>. Li et al. (2004) showed that colea litiasis, alcohol, and diet were the etiologic agents of 20.2%, 17.3% and 12.4% of cases, respectively. 36.1% of cases were idiopathic. Alcohol was rather more common

etiologic agent in men comparing with coledocholithiasis and coledocholithiasis was dominant reason in women<sup>15</sup>.

Levy and Geenen also indicated that 10-30% of acute pancreatitis have idiopathic<sup>20</sup>. Elta (2008) stated that a significant ratio of acute pancreatitis with unknown reason can be attributed to agents such as Microlithiasis which are invisible, consumption of some unknown drugs, or failure of Oddi sphincter<sup>21</sup>. Therefore, it seems that lack of adequate attention to history of some drugs consumption and also lack of attention to other unknown or uncommon reasons of pancreatitis such as Microlithiasis, some infections, congenital agents, different metabolic reasons and etc are justifier of existence of 58.44% suffering from pancreatitis with unknown reason and some differences with other studies.

In this survey, 4.33% of patients suffering from acute pancreatitis needed to hospitalization at the ICU during their hospitalization, 13.42% needed to receive blood and blood products, 15.88% needed to performance of diagnostic and therapeutic ERCP, 5.63% needed to performing surgery and 79.22% needed to drug therapy.

It has been shown in different studies that the average duration of hospitalization for patients with acute pancreatitis is 5 to 6 days<sup>6, 10</sup>. In the present study, also, the mean duration of patient's hospitalization was  $7.46 \pm 5.4$  days and in 29% of cases, 4-5 days duration was observed. But in some studies also, the numbers of hospitalization are reported higher or lesser. For instance, in study of Gompertz *et al*, the average duration of hospitalization was 15 days<sup>22</sup> which was not consistent with results of our results, also, in study

of Barreto *et al*, the patients suffering from acute pancreatitis were averagely hospitalized for 4 days<sup>14</sup>. Difference in hospitalization duration of patients with acute pancreatitis can be ascribed to severity of disease, society under study and/ or existence of disease or other problems.

The mean scores of BISAP and Ranson between subjects under study were  $0.7 \pm 0.87$  and  $0.98 \pm 0.92$ , respectively. Also, SIRS was positive in 53 patients (22.9%). In study of Gompertz *et al* that evaluated the strength of predictive BISAP Score in patients with acute pancreatitis, the mean BISAP Score was equal to 3. The mean of Ranson Score and BISAP Score in patients with hospitalization duration longer than 10 days was higher comparing with other groups that can indicate its correlation with clinical status of patients. Also, patients hospitalized in ICU who had been received blood or blood products or performed surgery or ERCP, and patients that had been died, showed Ranson Score, and BISAP Score higher than other groups. Also, patients with expanded necrosis in pancreas had higher Ranson Score, but BISAP Score was higher in patients with fluid accumulation. Its notable that Ranson Score and BISAP Score was lower in patients receiving drug therapy, that this issue emphasizes that these criteria determine the clinical status of patients appropriately.

## CONCLUSION

According to findings of this study and comparing them with other studies it is elicited that criteria such as age, gender, disease etiology and also predictive criteria such as Ranson Score and BISAP Score in patients with acute pancreatitis have a significant importance in more recognition and better prediction of clinical course and attention to these issues can be helpful in therapeutic process.

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