

# Gender differences in the epidemiology and clinical presentation of acute pancreatitis

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## ABSTRACT

**Background:** Patients with chronic pancreatitis can suffer from a range of intense pain, as well as problems related to the functioning of the digestive organs, the evaluation of the quality of life can provide valuable information about the level of physical and emotional discomfort felt by the patients after the surgical intervention.

**Methods:** A prospective study was carried out in the period 2014-2020 in which 113 patients with benign pancreatic pathology treated surgically admitted to the CF2 Clinical Hospital in Bucharest were included. For this study, the statistical method of simple linear regression was applied.

**Results:** Patients' quality of life can also be influenced by the level of social support and medical care they receive. A strong support network, which can provide emotional and practical support, as well as access to appropriate and specialist medical care, can play an important role in managing symptoms and improving patients' quality of life.

**Conclusions:** Although patients in this study experienced significant improvement in symptoms and ability to perform daily activities, it is important to pay attention to and manage persistent symptoms and postoperative complications to ensure the best possible quality of life.

**Keywords:** quality of life, chronic pancreatitis, benign chronic pancreatitis, surgical intervention

## INTRODUCTION

Acute pancreatitis is a potentially life-threatening condition with a mortality rate of approximately 5%. The current approach to treating acute pancreatitis involves supportive medical therapy, occasionally supplemented by endoscopic procedures and/or surgery [1].

The exocrine pancreas plays a vital role in synthesizing, storing and secreting digestive enzymes. Dysfunction of these functions frequently leads to pancreatitis, an inflammatory condition affecting the pancreas that can have serious consequences, including substantial morbidity and mortality [2].

Regarding acute pancreatitis, this is a condition that presents with sudden onset of abdominal pain and is characterized by an increase in pancreatic enzymes in the blood and urine. This happens because of a process of self-destruction of the pancreas triggered by the activation of zymogens in the glands.

Acute pancreatitis can range in severity from mild to severe. While most patients experience a self-limiting course of the disease, a small percentage progress to a severe form with both local and systemic complications [3].

## MATERIAL AND METHODS

A prospective study was carried out in the period 2014-2020 in which 113 patients with benign pancreatic pathology treated surgically admitted to the CF2 Clinical Hospital in Bucharest were included. The data analysis was carried out in SPSS version 26. For this study, the Chi Square test was applied.

The inclusion criteria include male and female patients, aged between 30-73 years, from urban and rural areas, admitted to the CF2 Clinical Hospital in Bucharest, who gave their written consent to be enrolled in the study. Exclusion criteria refer to patients under 30 years of age and patients from whom we did not obtain written consent to participate in the study.

The research group consists of patients with benign pancreatic pathology treated surgically.

The objective of this research was to analyze gender differences in the epidemiology and clinical presentation of acute pancreatitis.

## RESULTS

Following the analysis of the database from 2014-2020, we noticed that 113 patients with benign pancreatic pathology treated surgically admitted to the CF2 Clinical Hospital in Bucharest were included. Thus, we obtained the following results, as follows:

82.3% of the patients with benign pancreatic pathology treated surgically admitted to the Clinical Hospital

CF2 in Bucharest are male and 17.7% of the patients with benign pancreatic pathology treated surgically admitted to the Clinical Hospital CF2 in Bucharest are female (Table 1).

**TABEL 1.** Sex

	Sex	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	93	82.3	82.3	82.3
	female	20	17.7	17.7	100.0
<b>Total</b>		113	100.0	100.0	

83.2% of the patients with benign pancreatic pathology treated surgically admitted to the CF2 Clinical Hospital in Bucharest had acute pancreatitis, and 16.8% of the patients with benign pancreatic pathology treated surgically admitted to the CF2 Clinical Hospital in Bucharest did not have acute pancreatitis (Table 2).

**TABEL 2.** Acute pancreatitis

	Acute pancreatitis	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	94	83.2	83.2	83.2
	no	19	16.8	16.8	100.0
<b>Total</b>		113	100.0	100.0	

We set out to test the following hypotheses by applying the Chi Square test:

**H0.** There is no significant difference between gender and the risk of developing acute pancreatitis.

**H1.** There is a significant difference between gender and the risk of developing acute pancreatitis.

We note that men are more likely than women to develop acute pancreatitis (Table 3).

**TABEL 3.** Sex and the development of acute pancreatitis

			Acute pancreatitis		Total
			yes	no	
Sex	male	Count	93	0	93
		Expected Count	77.4	15.6	93.0
	female	Count	1	19	20
		Expected Count	16.6	3.4	20.0
<b>Total</b>		Count	94	19	113
		Expected Count	94.0	19.0	113.0

Following Chi Square testing (Table 4) we find that hypothesis H0. There is no significant difference between gender and the risk of developing acute pancreatitis. - is rejected

So that hypothesis H1. There is a significant difference between gender and the risk of developing acute pancreatitis. - it is accepted

**TABLE 4.** Applying the Chi Square test

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	106.208 <sup>a</sup>	1	.000		
Continuity Correction <sup>b</sup>	99.525	1	.000		
Likelihood Ratio	94.421	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	105.268	1	.000		
N of Valid Cases	113				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.36.

b. Computed only for a 2 × 2 table

Regarding the etiology of pancreatitis, 44.2% of the patients with surgically treated benign pancreatic pathology admitted to the CF2 Clinical Hospital in Bucharest had stone migration as the cause, and 28.3% of the surgically treated benign pancreatic pathology patients admitted to the CF2 Clinical Hospital in Bucharest had ethanolic cause, while 27.4% of the patients with benign pancreatic pathology treated surgically admitted to the CF2 Clinical Hospital in Bucharest had an allergic cause (Table 5).

**TABLE 5.** Etiology of pancreatitis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	allergic	31	27.4	27.4	27.4
	migration stones	50	44.2	44.2	71.7
	ethanol	32	28.3	28.3	100.0
<b>Total</b>		113	100.0	100.0	

Regarding the symptoms, we found that 64.6% of the patients with benign pancreatic pathology treated surgically admitted to the Clinical Hospital CF2 in Bucharest had epigastralgias, 15.9% of the patients with benign pancreatic pathology treated surgically admitted to the Clinical Hospital CF2 in Bucharest had pain diffuse abdominal pain, 13.3% of patients with benign pancreatic pathology treated surgically admitted to the CF2 Clinical Hospital in Bucharest had pain in the right hypochondrium, 5.3% of patients with benign pancreatic pathology treated surgically admitted to the CF2 Clinical Hospital in Bucharest had pain in the bar, while

**TABLE 6.** Symptomology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	pain in the bar	6	5.3	5.3	5.3
	flank pain bilaterally	1	.9	.9	6.2
	pain in the right hypochondrium	15	13.3	13.3	19.5
	epigastralgia	73	64.6	64.6	84.1
	diffuse abdominal pain	18	15.9	15.9	100.0
<b>Total</b>		113	100.0	100.0	

0.9% of patients with surgically treated benign pancreatic pathology admitted to the CF2 Clinical Hospital in Bucharest had bilateral flank pain (Table 6).

On the side of complications, 99.1% of patients with benign pancreatic pathology treated surgically admitted to the CF2 Clinical Hospital in Bucharest experienced complications, and 0.9% of patients with benign pancreatic pathology treated surgically admitted to the CF2 Clinical Hospital in Bucharest did not experience complications (Table 7).

**TABLE 7.** Complications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	1	.9	.9	.9
	no	112	99.1	99.1	100.0
<b>Total</b>		113	100.0	100.0	

Regarding the treatment part, 93.6% of the patients with benign pancreatic pathology treated surgically admitted to the Clinical Hospital CF2 in Bucharest received anti-algesic treatment, and 6.2% of the patients with benign pancreatic pathology treated surgically admitted to the Clinical Hospital CF2 in Bucharest did not receive anti-algesic treatment (Table 8).

**TABLE 8.** Anti-algesic treatment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	106	93.8	93.8	93.8
	no	7	6.2	6.2	100.0
<b>Total</b>		113	100.0	100.0	

Regarding the general condition at discharge, 92.9% of the patients with benign pancreatic pathology treated surgically admitted to the CF2 Clinical Hospital in Bucharest had a good general condition at discharge, and 7.1% of the patients with benign pancreatic pathology treated surgically admitted to the Clinical Hospital CF2 from Bucharest had an improved general condition at discharge (Table 9).

**TABLE 9.** General condition at discharge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	good	105	92.9	92.9	92.9
	ameliorated	8	7.1	7.1	100.0
<b>Total</b>		113	100.0	100.0	

## DISCUSSION

Patients presenting with multiple organ failure, persistent abdominal pain requiring analgesia, and/or disability are at increased risk of decreased quality of life [4].

The study by Lankisch et al. (2001) included 274 patients (63% men and 37% women) with a first disease attack. The study showed that there is a significant association between gender and the etiology of pancreatitis in general. The study found that men had acute alcohol-induced pancreatitis more frequently than women, while biliary pancreatitis predominated among women [5].

A 2013 study showed that from 2004 to 2010, a total of 42 patients diagnosed with severe acute pancreatitis were hospitalized and underwent surgery. Of these, 60% were men and 41% were women. Thus, 55% of patients underwent surgery more than 11 days after admission, while 25% of patients underwent surgery between 4 and 10 days after admission. While 20% of patients required emergency surgery, either as an immediate response within the first 24 hours or as a delayed emergency procedure within 24 to 72 hours [6].

The study by Zarnescu et al. (2015) in which he retrospectively reviewed the data of 146 patients hospitalized for acute pancreatitis between 1999 and 2013 showed that the etiology of acute pancreatitis was biliary in 48.6% of patients, followed by alcohol in 22.6% of patients, for 20.6% of patients it was idiopathic, and for 8.2% of the patients other causes were identified (hypertriglyceridemia, trauma, drugs) in 12 patients and idiopathic in 30 cases (20.6%). Regarding the interval between the onset of pancreatitis and hospitalization, it was less than 24 hours in 32% of patients [1].

Smoking and alcohol consumption are common co-existing behaviors and may synergistically contribute to the development of pancreatitis. A study of 108 smokers with alcohol-related pancreatitis found that smok-

ing accelerates the progression of pancreatic disease in a dose-dependent manner, distinct from the level of alcohol consumption [7].

Nicotine and NNK, the primary metabolites found in cigarette smoke, have been shown to cause functional and histological changes in the pancreas that are consistent with acute pancreatitis. These effects are mediated primarily through their interaction with acinar cells and modulation of zymogen secretion through pathways involving CCK (cholecystokinin) and preganglionic nicotinic receptors. In addition, the impact of cigarette smoke metabolites on the pancreatic microvasculature is thought to occur through the nitric oxide pathway [8].

Also, the study by Bohidar et al. (2003) showed that a total of 75 patients (51 men; mean age 41 years) with acute pancreatitis were included between January 1997 and June 1998. The causes of pancreatitis were gallstones in 48%, alcohol in 28% and others in 24% of patients [9].

The growing global obesity epidemic has contributed to the increase in both the incidence and severity of acute pancreatitis. This increased incidence can be attributed to various factors, including an increased risk of gallstones, hypertriglyceridemia (HTG), certain medications, and weight loss interventions. Obesity exacerbates the severity of acute pancreatitis by promoting uncontrolled lipolysis of visceral fat, which is rich in unsaturated triglycerides. This process leads to the release of unsaturated fatty acids (UFA), which inhibit mitochondrial complexes I and V, induce necrosis and worsen the condition [10].

## CONCLUSION

As we could observe in this study, gender differences in the epidemiology and clinical presentation of acute pancreatitis can be observed in several aspects, such as: incidence, etiology, clinical presentation, complications and response to treatment.

Following the analysis, we found that men are more likely to develop benign pancreatic pathology. Thus we can say that differences in hormonal production between the sexes can play a role in the development of pancreatic pathology. For example, higher levels of testosterone in men and estrogen in women can influence fat metabolism and impact the development of pancreatic diseases. Men may have certain behaviors and lifestyles that may increase the risk of benign pancreatic pathology. Excessive alcohol consumption, smoking, unhealthy diet and obesity are known risk factors for developing pancreatic disease, and these may be more common in men.

In this study we saw that the main cause of acute pancreatitis is gallstones (gallstones), followed by excessive alcohol consumption.

On the side of symptomatology, epigastralgia are in first place, followed by diffuse abdominal pain.

The patients in our study had no complications during the period 2014-2020. However, there are certain complications associated with acute pancreatitis that may have a different prevalence depending on gender. For example, pancreatic infections, kidney failure, and lung complications may be more common in men. In contrast, pregnancy-related complications, such as acute gestational pancreatitis, may exclusively affect women.

In terms of response to treatment, the general condition of the patients at discharge was good.

Male and female patients may have different experiences and psychological reactions to a condition such

as benign pancreatic pathology. Each gender may have its own cultural, social and emotional characteristics that may influence how patients adapt to and manage the disease, and these aspects may impact quality of life.

The data obtained from this study cannot be generalized, and gender differences in the epidemiology and clinical presentation of acute pancreatitis can be observed in general, but there are also individual variations within each category. Each case of pancreatitis must be evaluated and treated individually, taking into account the specific factors of the patient.

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