

**CAUSES AND RISK FACTORS OF ACUTE PANCREATITIS AMONG ADULTS IN KSA: A CROSS-SECTIONAL STUDY**

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**ABSTRACT**

**Objective:** This research aims to determine the Causes and Risk Factors of Acute Pancreatitis among Adults in KSA.

**Methods:** This study will utilize a cross-sectional design to assess the causes and risk factors of acute pancreatitis among adults in Saudi Arabia. The study aims to capture a snapshot of the population affected by this condition and analyze the correlations between various risk factors and the development of acute pancreatitis.

**Results:** The study included 370 participants. The most frequent gender among them is male (n= 200, 54.1%) and female (n= 170, 45.9%). The most frequent age among study participants was 40 years and more (n= 117, 31.6%), followed by 30-40 years (n= 93, 25.1%), then 31-35 years (n=80, 21.6%), 25-30 years (n=55, 14.9%) and less than 25 years (n=25, 6.8%). The most frequent nationality among study participants was Saudi (n= 322, 87%) and non-Saudi (n= 48, 13%). Educational level among study participants, with most of them being university (n= 176, 47.5%) followed by higher studies (n= 91, 24.5%), then school (n= 61, 16.4%), and illiterate (n=42, 11.3%). The most frequent smoking for the participants was smoked (n=162, 43.7%), followed by non-smoked (n=113, 30.5%) and ex-smoked (n=95, 25.6%).

**Conclusion:** This study reveals a high level of awareness among medical staff regarding correct sitting posture. A significant percentage of participants demonstrated adherence to proper ergonomic practices, highlighting the positive impact of awareness.

## **INTRODUCTION**

Acute pancreatitis (AP) is a life-threatening condition that may range from a minor, self-limiting illness to a catastrophic, deadly one when it spreads to other organs. To guide therapy, avoid recurrence, decrease morbidity and mortality, and ensure effective delivery of care, it is vital to understand the pattern of the illness in a specific population, including its etiology, severity, mortality, and its predictors [1]. Nevertheless, there is a severe dearth of epidemiological research that specifically targets these variables in the Middle East. The most current research on the topic in Saudi Arabian literature was published in 2001 by Al-Karawi et al. [2] and in 2003 by Singal et al. [3]. Both studies looked at AP-related hospitalizations over a long period of time (12 years) and were conducted at a single site. The frequency of hospitalizations caused by AP varied significantly among the kingdom's regions, according to these two studies. Also, mortality rates ranged from 1.8% in the south to 4.2% in the middle. Both investigations revealed that biliary pancreatitis was the leading cause.

Although these investigations helped fill in some gaps in our knowledge of AP's epidemiological characteristics in Saudis, a lot has changed in the fifteen to seventeen years since they were conducted. More and more people are experiencing health problems due to risk factors including smoking [4], obesity [5], and alcohol usage [6]. Nevertheless, there have been notable advancements in the fields of critical care, surgery, and endoscopic treatment. Thus, it is reasonable to presume that there has been a shift in both the incidence and the number of fatalities and complications caused by AP. There are contradictory tendencies in the Western literature on these two factors [7]. Several studies have shown that the number of hospitalizations due to AP has been steadily rising over the last decade, while others have shown that the incidence has been generally decreasing [8, 9]. In contrast, the majority of research conducted in Europe and the United States found a decline in mortality rates [10].

## **METHODS**

### **Study design**

This study will utilize a cross-sectional design to assess the causes and risk factors of acute pancreatitis among adults in Saudi Arabia. The study aims to capture a snapshot of the population affected by this condition and analyze the correlations between various risk factors and the development of acute pancreatitis.

### **Study approach**

The research will be conducted in several hospitals across major cities in Saudi Arabia, including Riyadh, Jeddah, and Dammam. These hospitals will include tertiary care centers and specialized gastroenterology units, where adult patients diagnosed with acute pancreatitis are treated.

### **Study population**

The target population for this study includes adult patients aged 18 years and above who have been diagnosed with acute pancreatitis and are receiving care in selected hospitals in Saudi Arabia. This population will provide insights into the common causes and risk factors of the condition within the Saudi context.

### **Study sample**

A total sample of 370 participants will be selected using purposive sampling from the hospitals involved in the study. This non-random sampling method ensures that individuals with a confirmed diagnosis of acute pancreatitis, who meet the study criteria, are included. The sample size has been calculated to ensure sufficient statistical power for analyzing the relationships between risk factors and the development of acute pancreatitis.

### Study tool

For the current study, the questionnaire was adopted for data collection, which was also categorized as a study tool.

### Data collection

Data will be collected using a structured questionnaire and reviewing the patient's medical records. The questionnaire will cover demographic information, medical history, lifestyle factors (e.g., alcohol consumption, diet, physical activity), and clinical outcomes. Trained research assistants will conduct face-to-face interviews with participants or their family members, ensuring the data is accurately recorded.

### Data analysis

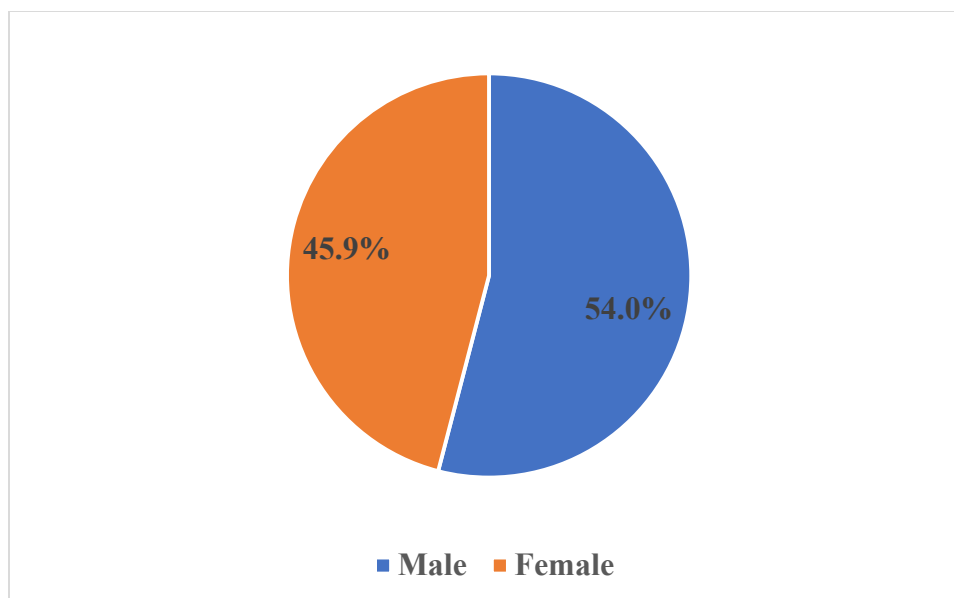
Data will be analyzed using SPSS software (version 26). Descriptive statistics (frequencies, percentages, means, and standard deviations) will be used to summarize demographic and clinical characteristics. Chi-square tests and logistic regression will be applied to assess the relationships between risk factors and the occurrence of acute pancreatitis. A p-value of  $<0.05$  will be considered statistically significant.

### Ethical considerations

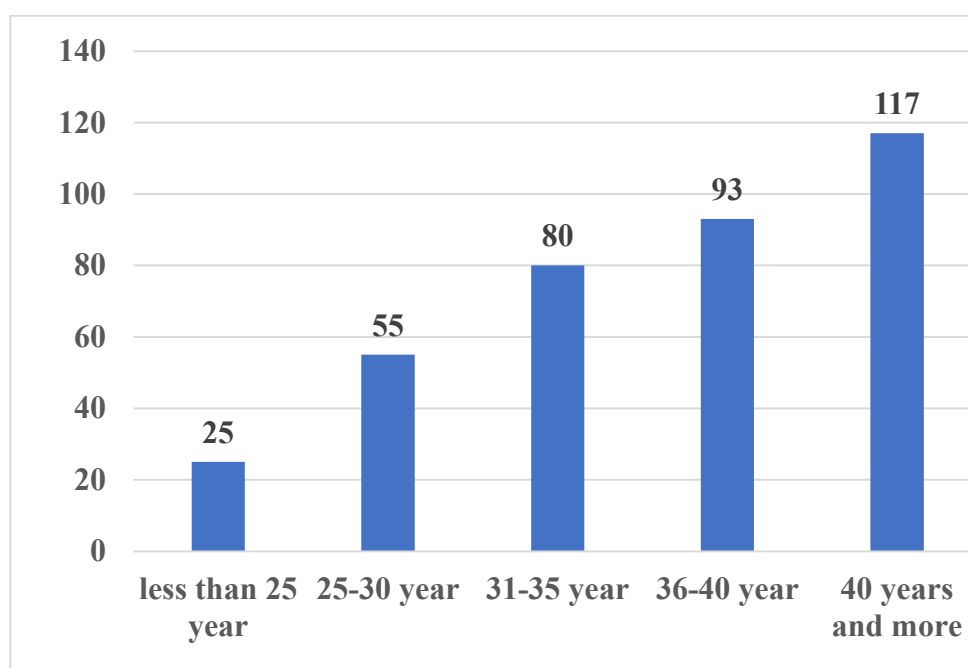
Ethical approval will be obtained from the participating hospitals' Institutional Review Board (IRB) before the study begins. Informed consent will be obtained from all participants, ensuring they understand the study's purpose, procedures, risks, and benefits. Confidentiality and anonymity of participant data will be maintained throughout the research process, and participants will have the right to withdraw from the study at any time without consequence.

## **RESULTS**

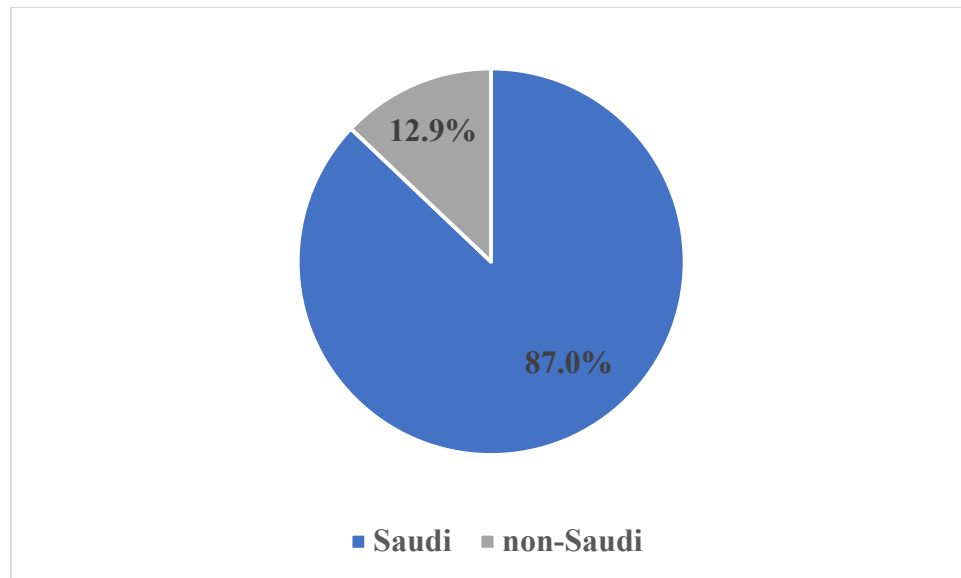
The study included 370 participants. The most frequent gender among them is male ( $n= 200$ , 54.1%) and female ( $n= 170$ , 45.9%). Figure 1 shows the gender distribution among study participants. The most frequent age among study participants was 40 years and more ( $n= 117$ , 31.6%), followed by 30-40 years ( $n= 93$ , 25.1%), then 31-35 years ( $n=80$ , 21.6%), 25-30 years ( $n=55$ , 14.9%) and less than 25 years ( $n=25$ , 6.8%). Figure 2 shows the age distribution among study participants. The most frequent nationality among study participants was Saudi ( $n= 322$ , 87%) and non-Saudi ( $n= 48$ , 13%). Figure 3 shows the distribution of nationality among study participants.



**Figure 1: Gender distribution among study participants**

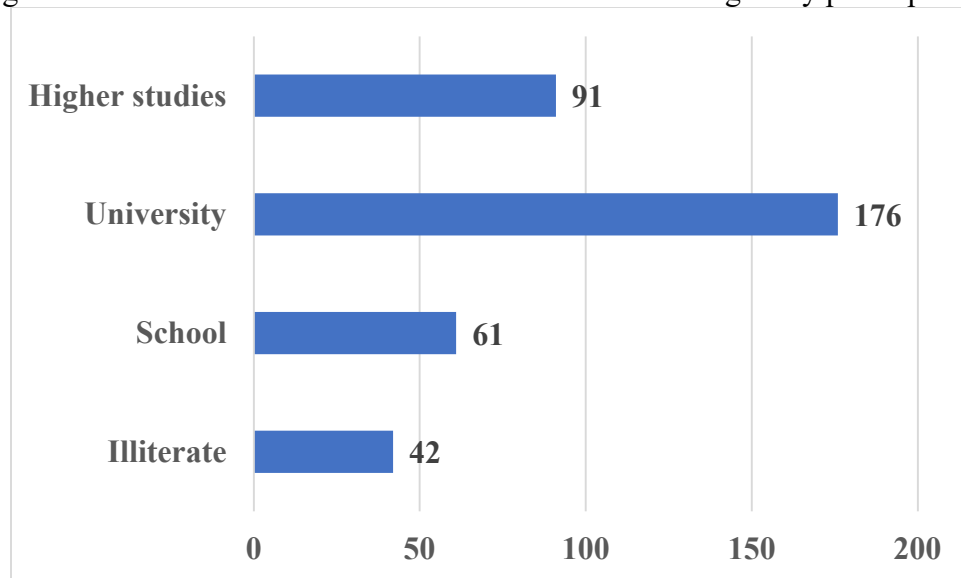


**Figure 2: Age distribution among study participants**



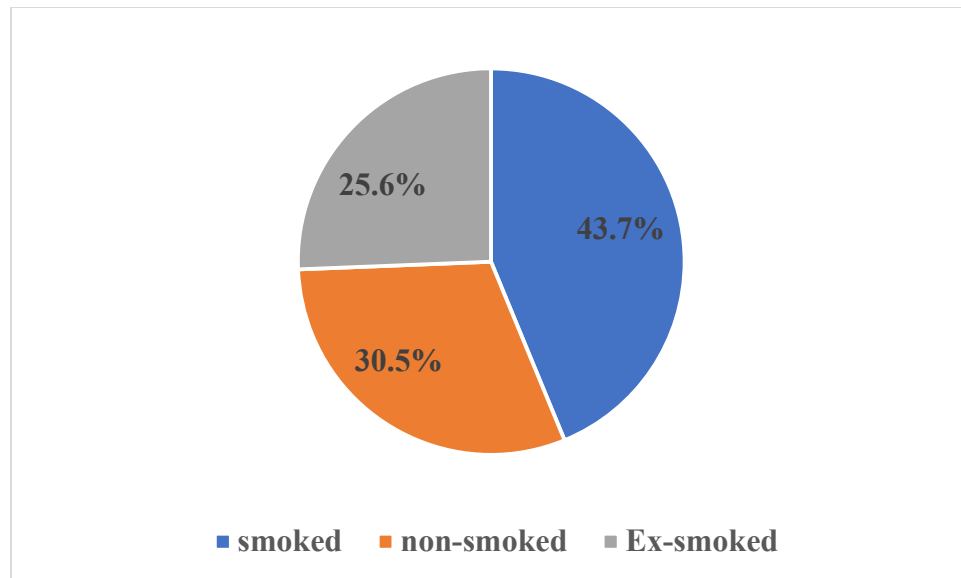
**Figure 3: Nationality distribution among study participants**

Educational level among study participants, with most of them being university (n= 176, 47.5%) followed by higher studies (n= 91, 24.5%), then school (n= 61, 16.4%), and illiterate (n=42, 11.3%). Figure 4 shows the distribution of educational levels among study participants.



**Figure 4: Educational level distribution among study participants**

The most frequent smoking for the participants was smoked (n=162, 43.7%), followed by non-smoked (n=113, 30.5%) and ex-smoked (n=95, 25.6%). Figure 5 shows the smoking distribution among study participants.



**Figure 5: Smoke distribution among study participants**

Participants were asked about the risk factors of acute pancreatitis. Their responses and results are presented in Table 1.

| <b>Table 1: Risk factors of acute pancreatitis</b> |                        |                        |
|----------------------------------------------------|------------------------|------------------------|
| <b>Risk factor</b>                                 | <b>Yes</b>             | <b>No</b>              |
| <b>Gallstone</b>                                   | <b>322<br/>(87%)</b>   | <b>48<br/>(13%)</b>    |
| <b>Smoking</b>                                     | <b>257<br/>(69.5%)</b> | <b>113<br/>(30.5%)</b> |
| <b>Alcohol</b>                                     | <b>13<br/>(3.5%)</b>   | <b>357<br/>(96.5%)</b> |
| <b>Obesity</b>                                     | <b>334<br/>(90.3%)</b> | <b>36<br/>(9.7%)</b>   |
| <b>High-fat diet</b>                               | <b>318<br/>(85.9%)</b> | <b>52<br/>(14.1%)</b>  |
| <b>Diabetes mellitus</b>                           | <b>330<br/>(89.2%)</b> | <b>40<br/>(10.8%)</b>  |
| <b>Genetic mutation</b>                            | <b>298<br/>(80.5%)</b> | <b>72<br/>(19.5%)</b>  |
| <b>Previous surgery</b>                            | <b>282<br/>(76.2%)</b> | <b>88<br/>(23.8%)</b>  |
| <b>Pancreatic duct obstruction</b>                 | <b>342<br/>(92.4%)</b> | <b>28<br/>(7.6%)</b>   |
| <b>Metabolic disorders</b>                         | <b>322<br/>(87%)</b>   | <b>48<br/>(13%)</b>    |

## **DISCUSSION**

In the US, acute pancreatitis ranks first among gastrointestinal illnesses that cause hospitalization. It is a frequent condition. In this condition, the pancreas becomes acutely inflammatory. From moderate cases requiring conservative therapy to complex, life-threatening illnesses, acute pancreatitis may range from mild to severe. In cases of moderate edematous pancreatitis, the mortality rate is 3%; in cases of pancreatic necrosis, it may reach 20% [11]. Although acute presentation is easy to diagnose, prognosticating how the illness will develop and what will happen is far more difficult. The amount of treatment needed is highly dependent on how long the condition has been present [12–14].

The Atlanta classification broadly classifies acute pancreatitis into 2 categories:

- Interstitial edematous acute pancreatitis is characterized by the acute inflammation of the pancreatic parenchyma and surrounding peri-pancreatic tissue.
- Necrotizing acute pancreatitis is characterized by necrosis of pancreatic parenchyma and peri-pancreatic tissue [15].

Based on the severity of the disease, acute pancreatitis is divided into the following types;

- In mild acute pancreatitis, local or systemic complications and organ failure are absent.
- In moderately severe acute pancreatitis, there are local complications with or without organic failure for less than 48 hours.
- In severe acute pancreatitis, there is persistent organ failure for more than 48 hours with the involvement of 1 or more than 1 organ.

An organ that aids digestion, the pancreas is situated in the back of the abdomen, just in front of the L1 and L2 vertebral bodies. Positioned transversely between the right and left duodenum and spleen is the pancreas. The four sections that make it up are the head, neck, body, and tail. The duodenal loop encircles the head of the pancreas, which rests on the right renal vein and inferior vena cava. Up to the splenic hilum stretches the tail of the pancreas. The exocrine and endocrine secretions are the two main ways in which the pancreas functions. Pancreatic endocrine secretions (glucagon and insulin) and exocrine secretions (pancreatic juice from the acinar cells) are released into the bloodstream by the main and accessory pancreatic ducts, respectively, and then into the duodenum [16].

## **CONCLUSION**

This study reveals a high level of awareness among medical staff regarding correct sitting posture. A significant percentage of participants demonstrated adherence to proper ergonomic practices, highlighting the positive impact of awareness.

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## **ANNEX 1: DATA COLLECTION TOOL**

### **Data collection tool (English Version)**

| Age (years)       |            | Gender    | Male       | Female         |
|-------------------|------------|-----------|------------|----------------|
| Nationality       | Saudi      | Non-Saudi |            |                |
| Educational level | Illiterate | School    | University | Higher studies |
| Smoke             | Non-smoke  | smoked    |            | Ex-smoke       |

### **Etiology of acute pancreatitis**

| Biliary            | Hyper-triglyceridemia | Idiopathic | Post-ERCP  |
|--------------------|-----------------------|------------|------------|
| Traumatic          | Malignancy            | Recurrent  | Autoimmune |
| Drug-induced       | Infection             | Mixed      | Alcoholic  |
| If others, specify |                       |            |            |

### **Risk factors of acute pancreatitis**

| Risk factor | Yes            | No             |
|-------------|----------------|----------------|
| Gallstone   | 322<br>(87%)   | 48<br>(13%)    |
| Smoking     | 257<br>(69.5%) | 113<br>(30.5%) |

|                                    |                              |                              |
|------------------------------------|------------------------------|------------------------------|
| <b>Alcohol</b>                     | <b>13</b><br><b>(3.5%)</b>   | <b>357</b><br><b>(96.5%)</b> |
| <b>Obesity</b>                     | <b>334</b><br><b>(90.3%)</b> | <b>36</b><br><b>(9.7%)</b>   |
| <b>High-fat diet</b>               | <b>318</b><br><b>(85.9%)</b> | <b>52</b><br><b>(14.1%)</b>  |
| <b>Diabetes mellitus</b>           | <b>330</b><br><b>(89.2%)</b> | <b>40</b><br><b>(10.8%)</b>  |
| <b>Genetic mutation</b>            | <b>298</b><br><b>(80.5%)</b> | <b>72</b><br><b>(19.5%)</b>  |
| <b>Previous surgery</b>            | <b>282</b><br><b>(76.2%)</b> | <b>88</b><br><b>(23.8%)</b>  |
| <b>Pancreatic duct obstruction</b> | <b>342</b><br><b>(92.4%)</b> | <b>28</b><br><b>(7.6%)</b>   |
| <b>Metabolic disorders</b>         | <b>322</b><br><b>(87%)</b>   | <b>48</b><br><b>(13%)</b>    |

## **APPENDIX 2: Participants responses to scale items**

### **gender**

|       |        | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|--------|-----------|---------|---------------|--------------------|
| Valid | Male   | 200       | 54.1    | 54.1          | 54.1               |
|       | Female | 170       | 45.9    | 45.9          | 100.0              |
|       | Total  | 370       | 100.0   | 100.0         |                    |

### **age**

|       |                   | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | less than 25 year | 25        | 6.8     | 6.8           | 6.8                |
|       | 25-30 year        | 55        | 14.9    | 14.9          | 21.6               |
|       | 31-35 year        | 80        | 21.6    | 21.6          | 43.2               |
|       | 36-40 year        | 93        | 25.1    | 25.1          | 68.4               |
|       | 40 years and more | 117       | 31.6    | 31.6          | 100.0              |
|       | Total             | 370       | 100.0   | 100.0         |                    |

### **Nationality**

|       |           | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-----------|-----------|---------|---------------|--------------------|
| Valid | Saudi     | 322       | 87.0    | 87.0          | 87.0               |
|       | non-Saudi | 48        | 13.0    | 13.0          | 100.0              |
|       | Total     | 370       | 100.0   | 100.0         |                    |

### Educational- level

|       |                | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------------|-----------|---------|---------------|--------------------|
| Valid | Illiterate     | 42        | 11.4    | 11.4          | 11.4               |
|       | School         | 61        | 16.5    | 16.5          | 27.8               |
|       | University     | 176       | 47.6    | 47.6          | 75.4               |
|       | Higher studies | 91        | 24.6    | 24.6          | 100.0              |
|       | Total          | 370       | 100.0   | 100.0         |                    |

### smoke

|       |            | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|------------|-----------|---------|---------------|--------------------|
| Valid | smoked     | 162       | 43.8    | 43.8          | 43.8               |
|       | non-smoked | 113       | 30.5    | 30.5          | 74.3               |
|       | Ex-smoked  | 95        | 25.7    | 25.7          | 100.0              |
|       | Total      | 370       | 100.0   | 100.0         |                    |

### Risk factors of acute pancreatitis

| Risk factor                 | Yes | No |
|-----------------------------|-----|----|
| Gallstone                   |     |    |
| Smoking                     |     |    |
| Alcohol                     |     |    |
| Obesity                     |     |    |
| High fat diet               |     |    |
| Diabetes mellitus           |     |    |
| Genetic mutation            |     |    |
| Previous surgery            |     |    |
| Pancreatic duct obstruction |     |    |
| Metabolic disorders         |     |    |