

ORIGINAL ARTICLE

Case-Control Study to Determine the Number Pancreatitis and Non-Pancreatitis Cases in Relation to Elevated Biochemical Markers among Patients Admitted in Gastroenterology Unit at Tertiary Care Hospital, Belagavi

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ABSTRACT

A case-control study was conducted to determine the number pancreatitis and non-pancreatitis cases in relation to elevated biochemical markers among patients admitted in gastroenterology unit at tertiary care hospital, Belagavi." Aim of the study is to determine the number pancreatitis and non-pancreatitis cases in relation to elevated biochemical markers among patients with selected demographic variables, and to determine the association between case group and control group in relation to results of biochemical markers among patients. The researcher employed purposive sampling technique, and the numbers of subjects were 65, and tabulation has been done by descriptive and inferential statistics.

Materials and Methods: In the current study researcher employed case-control study approach, and research methodology was quantitative with descriptive in nature, and the study variables included in the study Number pancreatitis and non-pancreatitis cases admitted in gastroenterology unit. Tertiary care hospital Belagavi. By implementing purposive sampling with 65 numbers of samples.

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Results: Table 5: In accordance to blood investigation among pancreatitis cases with their Mean, mean %, and SD. (Case-group). Revealed that, in accordance to age majority of the findings belonged to 36-40 years were 7 (35%) their mean 3 (30%), and SD will be 9.2. more or less similar findings belonged to 20-25 years were 6 (30%) their mean 3 (30%) and SD will be 9.4. more or less similar findings belonged to 26-30 years were 4 (20%) their mean 2 (20%) and SD will be 6.2. more or similar findings belonged to 31-35 years were 3 (15%) their mean 2 (20%) and SD will be 6.4.

In accordance to religion age majority of the findings belonged to Hindu were 7 (35%) their mean 3 (30%) and SD will be 9.6. more or less similar findings belonged to Muslim were 5 (25%) their mean 2 (20%) and SD will be 6.4. more or less similar findings belonged to others were 7 (25%) their mean 3 (30%) and SD will be 9.4. Less similar findings belonged to others Christians were 5 (25%) their mean 3 (30%) and SD will be 6.2.

Table 6, revealed that, in accordance to age majority of the findings belonged to 36-40 years were 7 (35%) their mean 3 (30%), and SD will be 9.2. more or less similar findings belonged to 20-25 years were 6 (30%) their mean 3 (30%) and SD will be 9.4. more or less similar findings belonged to 26-30 years were 4 (20%) their mean 2 (20%) and SD will be 6.2. more or similar findings belonged to 31-35 years were 3 (15%) their mean 2 (20%) and SD will be 6.4.

In accordance to religion age majority of the findings belonged to Hindu were 7 (35%) their mean 3 (30%) and SD will be 9.6. more or less similar findings belonged to Muslim were 5 (25%) their mean 2 (20%) and SD will be 6.4. more or less similar findings belonged to others were 7 (25%) their mean 3 (30%) and SD will be 9.4. Less similar findings belonged to others Christians were 5 (25%) their mean 3 (30%) and SD will be 6.2.

Conclusion: The findings of the study revealed that majority of the findings were with the complaints of pancreatitis with elevated biochemical markers, Less number of the findings were non-pancreatitis cases with other associated illness and their biochemical markers are in normal range.

KEYWORDS

• Case-Control Study • Pancreatitis • Biochemical Markers • Gastroenterology Unit

INTRODUCTION

Acute pancreatitis (AP) is one of the most common gastrointestinal causes for hospitalization in the United States. In 2015, AP accounted for approximately 390000 hospitalizations. The burden of AP is only expected to increase over time. Despite recent advances in medicine, pancreatitis continues to be associated with a substantial morbidity and mortality. The most common cause of AP is gallstones, followed closely by alcohol use. The diagnosis of pancreatitis is established with any two of three following criteria: Abdominal pain consistent with that of AP; Serum amylase and/or lipase greater than three times the upper limit of normal; and Characteristics findings seen in cross-sectional abdominal imaging. Multiple criteria

and scoring systems have been established for assessing severity of AP.¹

Adequate nutrition is one of the basic elements in the treatment of patients suffering from acute or chronic pancreatitis. During reconvalescence, patients should be advised to adhere strictly to an individual low-saturated fat diet, with fibre restriction. Total daily energy requirement should be divided into five smaller, more frequent meals. Boiling, steaming, or roasting in parchment or aluminium foil are recommended methods for food preparation. In addition, patients who are following a dietary plan for pancreatitis must avoid barbequing or deep-frying. In order to reduce dietary fibre content, it is necessary to replace wholegrain products with semolina

or small pasta, and to avoid raw fruit and vegetables in the diet. Moreover, brassica and leguminous vegetables must be eliminated from the patients' menu, because they can cause flatulence. Patients should choose low-fat products like: milk with up to 2% fat, low-fat meat, and cold cuts (poultry, turkey, veal). When it comes to preparation of soups and sauces, patients with pancreatitis should avoid roux and strong bullion.²

Acute pancreatitis is a complex disease that varies in severity and course. Prompt diagnosis and stratification of severity influence proper management. Scoring systems are useful adjuncts but should not supersede clinical judgment. Fluid management and nutrition are very important aspects of care for acute pancreatitis.³

Chronic pancreatitis is a multifactorial, fibro inflammatory syndrome in which repetitive episodes of pancreatic inflammation lead to extensive fibrotic tissue replacement, resulting in chronic pain, exocrine and endocrine pancreatic insufficiency, reduced quality of life, and a shorter life expectancy. The incidence and prevalence of chronic pancreatitis is rising and no curative treatment is available. Using novel diagnostic algorithms, definitive chronic pancreatitis can be diagnosed by imaging criteria alone, whereas probable chronic pancreatitis requires clinical features and imaging criteria. Criteria for the diagnosis of early chronic pancreatitis are still under discussion and need prospective validation in clinical trials. Cross-sectional imaging should be used first; endoscopic ultrasound is needed only when CT or MRI are inconclusive or to plan therapeutic interventions.⁴

The incidence of acute pancreatitis continues to increase worldwide, and it is one of the most common gastrointestinal causes for hospital admission in the USA. In the past decade, substantial advancements have been made in our understanding of the pathophysiological mechanisms of acute pancreatitis. Studies have elucidated mechanisms of calcium-mediated acinar cell injury and death and the importance of store-operated calcium entry channels and mitochondrial permeability transition pores. The cytoprotective role of the unfolded protein response and autophagy in preventing sustained endoplasmic reticulum stress, apoptosis and necrosis has also been characterized, as has the central role of unsaturated fatty acids in causing pancreatic organ failure.⁵

OBJECTIVES

- To determine the number pancreatitis and non-pancreatitis cases in relation to elevated biochemical markers among patients with selected demographic variables.
- To determine the association between case group and control group in relation to results of biochemical markers among patients.

HYPOTHESES

H₁: There will be no significant association between pancreatitis and non-pancreatitis cases in relation to elevated biochemical markers among patients with selected demographic variables.

H₂: There will be significant association between pancreatitis and non-pancreatitis cases in relation to elevated biochemical markers among patients with selected demographic variables.

Abbreviations

AP	Acute Pancreatitis
CP	Chronic Pancreatitis
CT	Computerized Tomography
MRI	Magnetic Resonance Imaging
MLP	Multilayer perception
FBS	Fasting Blood Sugar
RBS	Random Blood Sugar
PPBS	Post Prandial Blood Sugar
BISAP	Bedside Index For Severity In Acute Pancreatitis
MAP	Mild Acute Pancreatitis

NEED FOR THE STUDY

Chronic pancreatitis is a progressive fibro inflammatory disease that exists in large-duct (often with intraductal calculi) or small-duct form. In many patients this disease results from a complex mix of environmental (eg, alcohol, cigarettes, and occupational chemicals) and genetic factors (eg, mutation in a trypsin-controlling gene or the cystic fibrosis trans-membrane conductance regulator); a few patients have hereditary or autoimmune disease. Pain in the form of recurrent attacks of pancreatitis (representing paralysis of apical exocytosis in acinar cells) or constant and disabling pain is usually the main symptom. Management of the pain is mainly empirical, involving potent analgesics, duct drainage by endoscopic or surgical means, and partial or total pancreatectomy.

However, steroids rapidly reduce symptoms in patients with autoimmune pancreatitis, and micronutrient therapy to correct electrophilic stress is emerging as a promising treatment in the other patients. Steatorrhoea, diabetes, local complications, and psychosocial issues associated with the disease are additional therapeutic challenges.⁶

Pancreatitis is a common gastrointestinal disorder in human beings. In the United States alone, approximately 300,000 patients are discharged from a hospital with a diagnosis of pancreatitis every year. This number does not include patients with mild pancreatitis who are not hospitalized or patients with fatal disease. In addition, it is estimated that approximately 90% of all cases of pancreatitis remain undiagnosed. The true incidence of pancreatitis in dogs and cats is unknown. A study of necropsy findings reported that 1.5% of 9342 canine pancreata and 1.3% of 6504 feline pancreata showed significant pathologic lesions.⁷

Acute pancreatitis is an inflammation of the glandular parenchyma of the retroperitoneal organ that leads to injury with or without subsequent destruction of the pancreatic acini. This inflammatory process can either result in a self-limited disease or involve life-threatening multiorgan complications.⁸

REVIEW OF LITERATURE

Descriptive study to analyse the perioperative nursing methods for patients with hepatobiliary pancreatic diseases combined with diabetes mellitus and to evaluate the differences in nursing methods based on a multilayer perceptron (MLP) neural network. Methods. 80 patients with hepatobiliary and pancreatic diseases complicated with diabetes admitted to our hospital from January 2021 to January 2022 were selected as subjects. According to different nursing methods, two groups of hepatobiliary and pancreatic diseases with diabetes were randomly divided into the control group and the experimental group, 40 patients in each group, two groups were given routine nursing care, and the experimental group was given perioperative nursing intervention on the basis of routine nursing. The fasting blood glucose (FBG), postprandial two-hour blood glucose (2hPG), and glycosylated haemoglobin (HbA1c) index of two groups of patients with hepatobiliary pancreatic diseases and diabetes

mellitus were observed and compared. The incidence of postoperative complications, the average hospitalization time of patients, and the clinical nursing satisfaction rate of patients were observed and compared.⁹

Case-control study aimed to evaluate the effectiveness of the clinical nursing pathway model in the care of patients with mild acute pancreatitis (MAP). We conducted a retrospective analysis of medical records for 80 patients diagnosed with MAP at our hospital between September 2021 and March 2023. The patients were randomly assigned to 2 groups: the control group, which received routine nursing care, and the observation group, which followed the clinical nursing pathway. The primary outcomes assessed were the time to symptom relief, recovery time from gastrointestinal bloating, emotional status, blood biochemical indicators, self-efficacy, self-care ability, and quality of life. The observation group experienced significantly shorter times for the resolution of abdominal pain and bloating, normalization of serum/urine amylase levels, and anal exhaust compared to the control group ($P < .05$).¹⁰

Prospective evaluation aim was to prospectively evaluate the ability of the bedside index for severity in acute pancreatitis (BISAP) score to predict mortality as well as intermediate markers of severity in a tertiary center. The BISAP score was evaluated among 397 consecutive cases of acute pancreatitis admitted to our institution between June 2005 and December 2007. BISAP scores were calculated on all cases using data within 24 h of presentation. The ability of the BISAP score to predict mortality was evaluated using trend and discrimination analysis. The optimal cutoff score for mortality from the receiver operating curve was used to evaluate the development of organ failure, persistent organ failure, and pancreatic necrosis.¹¹

Clinical based study to investigate whether there has been a reduction in mortality associated with acute pancreatitis over the past 20 years and the reasons for this reduction. The mortality associated with acute pancreatitis varies markedly in different studies, with most frequently reported mortality rates of 10% to 15% for all cases and 15% to 90% for attacks regarded as "severe." More recently, various centres have recorded lower mortality rates of 4% to 7% for all attacks of acute pancreatitis

and 20% to 50% for those regarded as severe. There has been considerable reduction in the mortality associated with acute pancreatitis over the past 20 years. The reasons are multifactorial, but recognition of severity signs, early implementation of organ-specific therapy, and newer endoscopic, surgical, and angiographic therapy for infection cyst and bleeding appear to have been the major factors in reducing mortality.¹²

METHODOLOGY

Research Approach: Case-control study.

Research Methodology: Quantitative in nature

Research design: Descriptive in nature.

Study Variables: Number pancreatitis cases admitted in gastroenterology unit.

Research Setting: Tertiary care hospital Belagavi.

Sampling Technique: Purposive Sampling

Sample Size: 65 Subjects.

Data collection tool: The tool consists of 3 sections.

Section A: To determine the number of pancreatitis cases with biochemical marker results with selected demographic variables. (Case group).

Section B: To determine the number of non-pancreatitis cases with biochemical marker results with selected demographic variables. (Control group).

Section C: To determine the comparison between case group and control group with biochemical marker results.

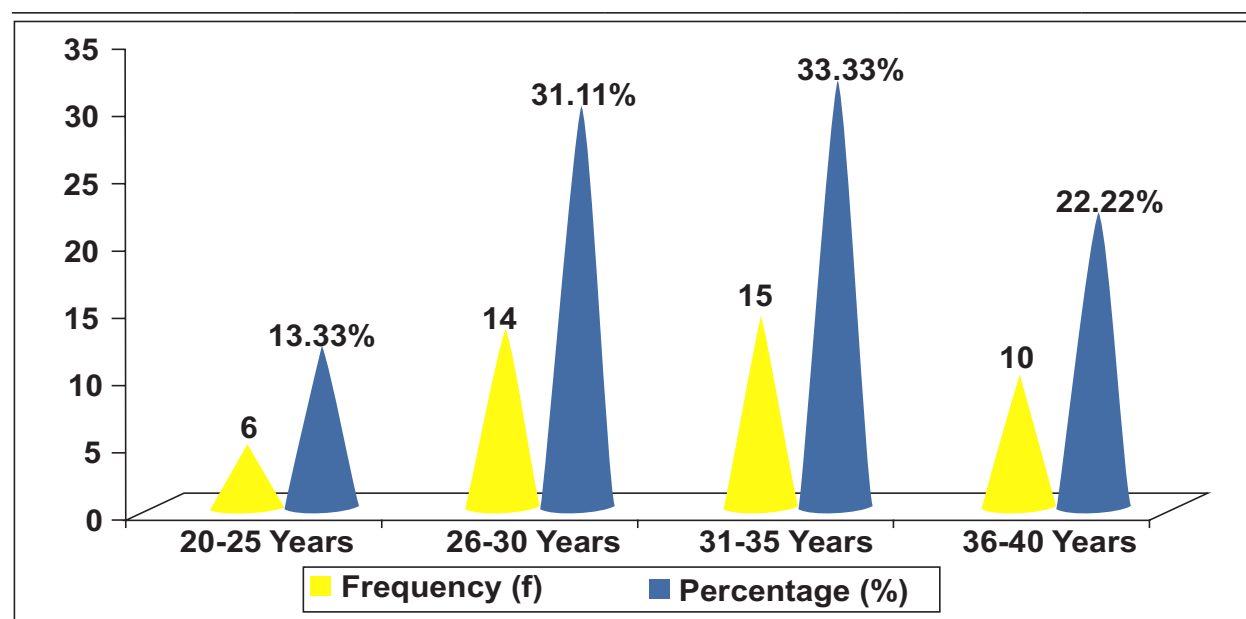
RESULTS

Section A: To determine the number of pancreatitis cases with biochemical marker results (Case group).

Table 1: Age Distribution

N= 45

Demographic Variables	Biochemical Markers		Frequency (f)	Percentage (%)
	Serum Amylase	Serum Lipase		
Normal Range	30-110 units/Litre	0-160 units/Litre		
Age				
20-25 Years	130 units/Litre	168 units/Litre	6	13.33
26-30 Years	125 units/Litre	173 units/Litre	14	31.11
31-35 Years	135 units/Litre	175 units/Litre	15	33.33
36-40 Years	115 units/Litre	165 units/Litre	10	22.22
		Total	45	100%



Graph 1: Age distribution of respondents

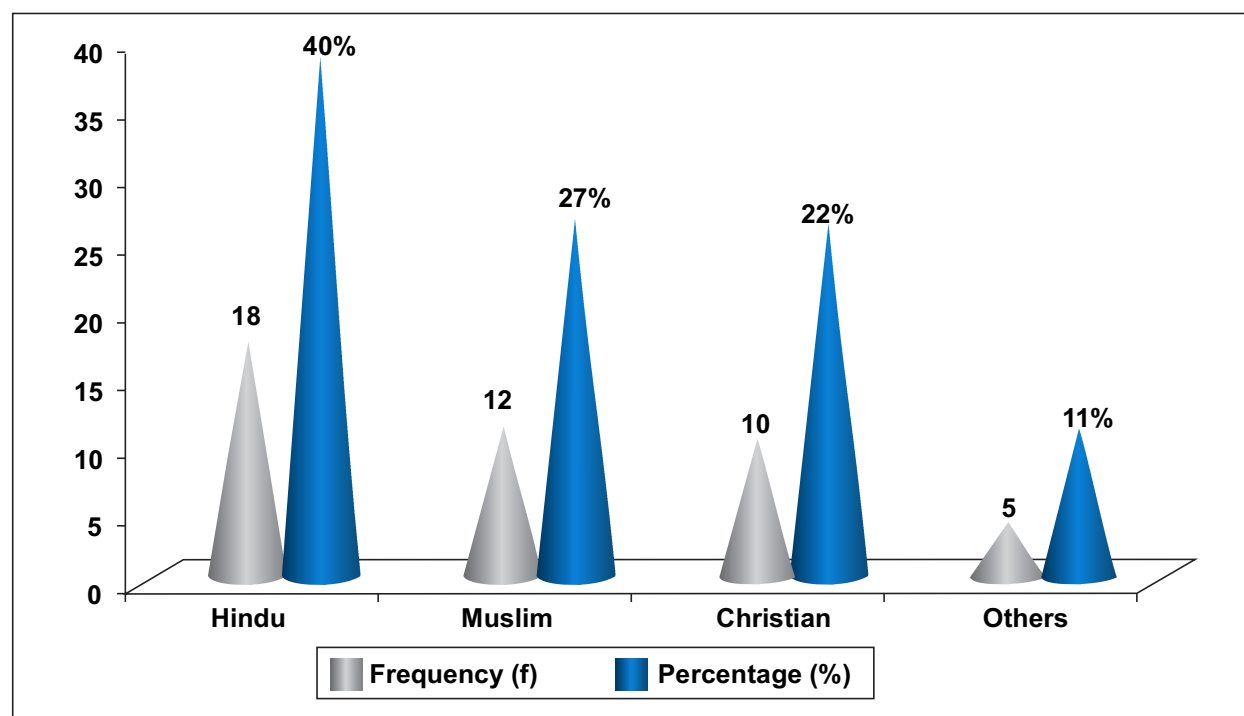
Graph 1, revealed that majority of the respondents 15 (33.33%) are having the biochemical markers results i.e. serum amylase 120 units/Litre and serum lipase is 175 units/Litre, belonged to 31-35 years. 14 (31.11%) are having the biochemical markers results i.e. serum amylase 119 units/Litre and serum lipase is 171 units/Litre, belonged to 26-30

years. 10 (22.22%) are having the biochemical markers results i.e. serum amylase 135 units/Litre and serum lipase is 182 units/Litre, belonged to 36-40 years, 6 (13.33%) are having the biochemical markers results i.e. serum amylase 115 units/Litre and serum lipase is 165 units/Litre, belonged to 20-25 years.

Table 2: Religion Distribution

N= 45

Demographic Variables	Biochemical Markers		Frequency (f)	Percentage (%)
	Serum Amylase	Serum Lipase		
Normal Range	30-110 units/Litre	0-160 units/Litre		
<i>Religion</i>				
Hindu	130 units/Litre	168 units/Litre	18	40
Muslim	125 units/Litre	173 units/Litre	12	27
Christian	135 units/Litre	175 units/Litre	10	22
Others	115 units/Litre	165 units/Litre	5	11
	Total		45	100%



Graph 2: Gender distribution of respondents

Graph 2, revealed that majority of the respondents 18 (40%) are having the biochemical markers results i.e. serum amylase 130 units/Litre and serum lipase is 130 units/Litre, belonged to Hindu. 12 (27%) are having the biochemical markers results i.e. serum amylase 125 units/Litre and serum lipase is 173 units/Litre, belonged to Muslim. 10 (22%) are having the biochemical markers results i.e. serum amylase 135 units/Litre and serum

lipase is 175 units/Litre, belonged to Christian. 5 (11%) are having the biochemical markers results i.e. serum amylase 115 units/Litre and serum lipase is 165 units/Litre, belonged to others.

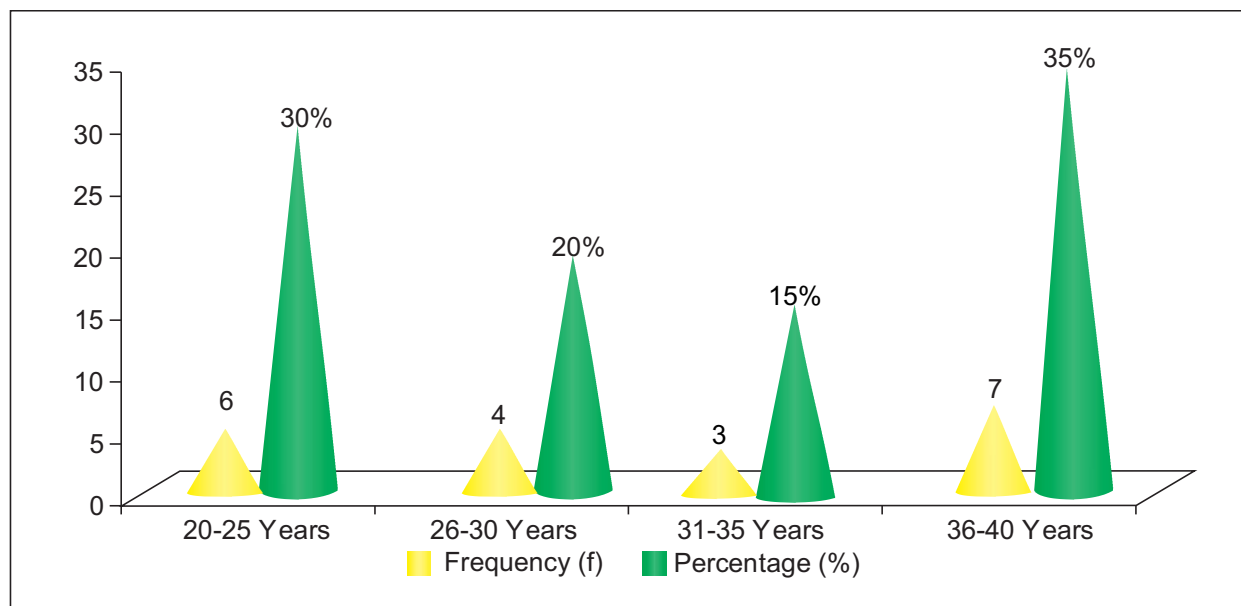
Section B: To determine the number of non-pancreatitis cases with biochemical marker results with selected demographic variables. (Control group).

Table 3: Age Distribution

N= 20

Demographic Variables	Biochemical Markers		Frequency (f)	Percentage (%)
	Serum Amylase	Serum Lipase		
Normal Range	30-110 units/Litre	0-160 units/Litre		
<i>Age</i>				
20-25 Years	70 units/Litre	74 units/Litre	6	30
26-30 Years	82 units/Litre	85 units/Litre	4	20
31-35 Years	95 units/Litre	105 units/Litre	3	15
36-40 Years	100 units/Litre	105 units/Litre	7	35
	Total		20	100%

*P-value < 0.05 level of significance.



Graph 3: Age distribution of respondents

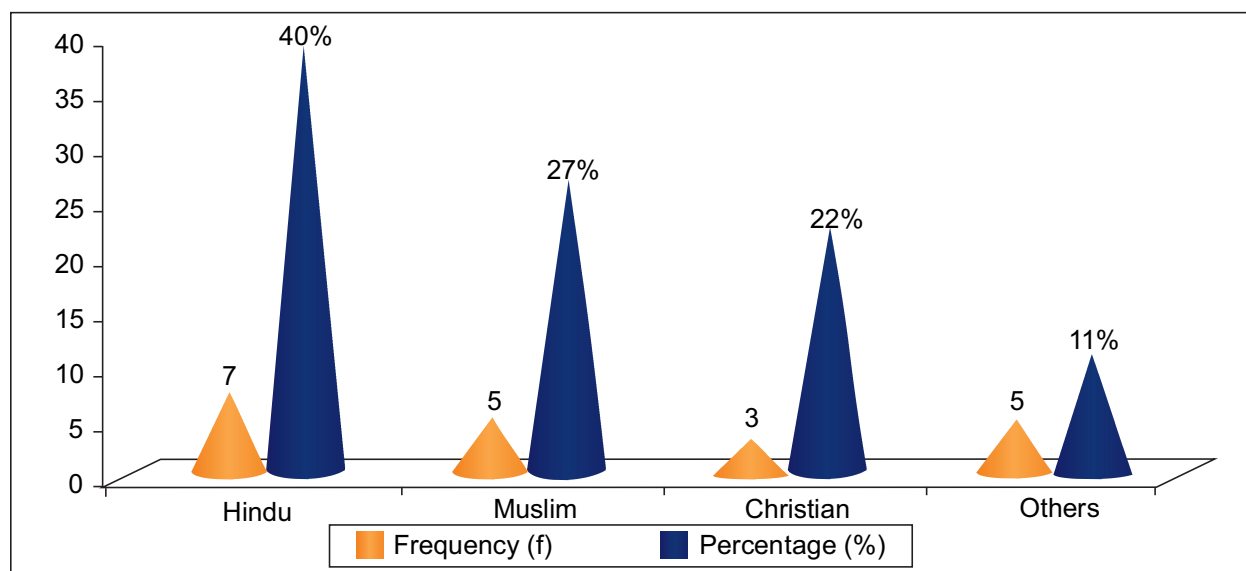
Graph 3, revealed that majority of the respondents 7 (35%) are having the biochemical markers results i.e. serum amylase 100 units/Litre and serum lipase is 105 units/Litre, belonged to 36-40 years. 6 (30%) are having the biochemical markers results i.e. serum amylase 70 units/Litre and serum lipase is 74 units/Litre, belonged to 20-25 years. 4 (20%)

are having the biochemical markers results i.e. serum amylase 82 units/Litre and serum lipase is 85 units/Litre, belonged to 26-30 years, 3 (15%) are having the biochemical markers results i.e. serum amylase 92 units/Litre and serum lipase is 105 units/Litre, belonged to 31-35 years.

Table 4: Religion Distribution

Demographic Variables	Biochemical Markers		Frequency (f)	Percentage (%)
	Serum Amylase	Serum Lipase		
Normal Range	30-110 units/Litre	0-160 units/Litre		
<i>Religion</i>				
Hindu	45 units/Litre	52 units/Litre	7	35
Muslim	65 units/Litre	71 units/Litre	5	25
Christian	35 units/Litre	42 units/Litre	3	15
Others	74 units/Litre	82 units/Litre	5	25
	Total		20	100%

*P value < 0.05 level of significance



Graph 4: Religion distribution of respondents

Graph 4, revealed that majority of the respondents 7 (35%) are having the biochemical markers results i.e. serum amylase 45 units/Litre and serum lipase is 52 units/Litre, belonged to Hindu. 5 (25%) are having the biochemical markers results i.e. serum amylase 65 units/Litre and serum lipase is 71 units/Litre, belonged to Muslim. 5 (25%) are having the biochemical markers results i.e. serum amylase 74 units/Litre and serum lipase is 82 units/Litre, belonged to others. 3 (15%) are having the biochemical markers results i.e. serum amylase 35 units/Litre and serum lipase is 42 units/Litre, belonged to others.

Litre, belonged to Muslim. 5 (25%) are having the biochemical markers results i.e. serum amylase 74 units/Litre and serum lipase is 82 units/Litre, belonged to others. 3 (15%) are having the biochemical markers results i.e. serum amylase 35 units/Litre and serum lipase is 42 units/Litre, belonged to others.

Table 5: In accordance to blood investigation among pancreatitis cases with their Mean, mean %, and SD (Case-group) N= 45

Demographic Variables	Frequency (f)	Percentage (%)	Mean	Mean (%)	SD	Chi-square
Age						
20-25 Years	6	13.33	3	12	4.2	X ² = 8.04 DF= 9 *P Value- 0.52
26-30 Years	14	31.11	7	28	9.4	
31-35 Years	15	33.33	8	34	11.3	
36-40 Years	10	22.22	5	26	8.1	
Total	45	100%	23	100%		
Religion						
Hindu	18	40	9	39	13.2	X ² = 11.4 DF= 9 *P Value- 0.54
Muslim	12	27	6	26	8.2	
Christian	10	22	5	22	7.1	
Others	5	11	3	13	5.3	
Total	45	100%	23	100%		

*P value > 0.05 level of significance

Table 5, revealed that, in accordance to age majority of the findings belonged to 31-35 years were 15 (33.33%) their mean 8 (34%), and SD will be 11.3. more or less similar findings belonged to 26-30 years were 14 (31.11%) their mean 7 (28%) and SD will be 9.4. more or less similar findings belonged to 36-40 years were 10 (22.22%) their mean 5 (26%) and SD will be 8.1. Less similar findings belonged to 20-25 years were 6 (13.33%) their mean 3 (12%) and SD will be 4.2.

In accordance to religion age majority of the findings belonged to Hindu were 18 (40%) their mean 9 (39%) and SD will be 13.2. more or less similar findings belonged to Muslim were 12 (27%) their mean 6 (26%) and SD will be 8.2. more or less similar findings belonged to Christians were 10 (22%) their mean 5 (22%) and SD will be 7.1. Less similar findings belonged to others were 5 (11%) their mean 3 (13%) and SD will be 5.3.

Table 6: In accordance to blood investigation among non-pancreatitis cases with their Mean, mean %, and SD (Control-group). N= 20

Demographic Variables	Frequency (f)	Percentage (%)	Mean	Mean (%)	SD	Chi-square
Age						
20-25 Years	6	30	3	30	9.4	X ² = 8.10
26-30 Years	4	20	2	20	6.2	DF= 9
31-35 Years	3	15	2	20	6.4	*P Value- 0.52
36-40 Years	7	35	3	30	9.2	
Total	20	100%	10	100%		
Religion						
Hindu	7	35	3	30	9.6	X ² = 9.12
Muslim	5	25	2	20	6.4	DF= 9
Christian	3	15	2	20	6.2	*P Value- 0.56
Others	5	25	3	30	9.4	
Total	20	100%	10	100%		

*P value > 0.05 level of significance

Table 5, revealed that, in accordance to age majority of the findings belonged to 36-40 years were 7 (35%) their mean 3 (30%), and SD will be 9.2. more or less similar findings belonged to 20-25 years were 6 (30%) their mean 3 (30%) and SD will be 9.4. more or less similar findings belonged to 26-30 years were 4 (20%) their mean 2 (20%) and SD will be 6.2. more or similar findings belonged to 31-35 years were 3 (15%) their mean 2 (20%) and SD will be 6.4.

In accordance to religion age majority of the findings belonged to Hindu were 7 (35%) their mean 3 (30%) and SD will be 9.6. more or less similar findings belonged to Muslim were 5 (25%) their mean 2 (20%) and SD will be 6.4. more or less similar findings belonged to others were 7 (25%) their mean 3 (30%) and SD will be 9.4. Less similar findings belonged to others Christians were 5 (25%) their mean 3 (30%) and SD will be 6.2.

DISCUSSION

In the present study revealed that, in accordance to age majority of the findings belonged to 36-40 years were 7 (35%) their mean 3 (30%), and SD will be 9.2. more or less similar findings belonged to 20-25 years were 6 (30%) their mean 3 (30%) and SD will be 9.4. more or less similar findings belonged to 26-30 years were 4 (20%) their mean 2 (20%) and SD will be 6.2. more or similar findings belonged to 31-35 years were 3 (15%) their mean 2 (20%) and SD will be 6.4.

In accordance to religion age majority of the findings belonged to Hindu were 7 (35%) their mean 3 (30%) and SD will be 9.6. more or less similar findings belonged to Muslim were 5 (25%) their mean 2 (20%) and SD will be 6.4. more or less similar findings belonged

to others were 7 (25%) their mean 3 (30%) and SD will be 9.4. Less similar findings belonged to others Christians were 5 (25%) their mean 3 (30%) and SD will be 6.2.

In the similar study investigated the use of both amylase and lipase in the diagnosis of AP. The purpose of combining amylase and lipase in the diagnosis of AP was to investigate whether utilizing both offers substantial advantages over using only one biochemical marker, particularly li-pase. It has been reported that combining amylase at 330U/L and lipase at 900U/L resulted in 50% sensitivity and 99% specificity rating.¹¹⁶ The combined sensitivity is equiv-alent to the amylase sensitivity rating but significantly in-ferior to the lipase sensitivity rating. When amylase and lipase are used as single diagnostic tests, the combined specificity rating is similar.¹¹⁶ In terms of sensitivity, it is preferable to utilize lipase as the only diagnostic test because it has a substantially greater sensitivity rating than the combination test.^{86,116,126} In terms of specificity, there is no discernible benefit to combining the amylase and lipase tests for the diagnosis of AP as compared to ap-plying simply a lipase test.^{86,116,126}

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