

Pancreatitis and its relationship to diabetes

Obaida Thuloj*, Yahya Almasri, Taghreed Hammoud

Abstract

Background: In recent years, Post-Pancreatitis Diabetes Mellitus (PPDM), also known as type 3 diabetes mellitus, has received a great deal of attention from researchers. PPDM is one of the long-term sequelae of pancreatitis and PPDM is now the second most common cause of new onset diabetes in adults after type T2DM beyond type (T1DM), the aim of this study was to find out the proportion of patients who developed secondary diabetes mellitus as a complication of pancreatitis.

Methods: A cross-sectional study in Damascus hospital, in the department of gastroenterology included 215 cases from 2017 to 2023.

Results: The percentage of males was 116 (54%) and the average age of the sample was approximately 45 years. Reef Dimashq had the largest percentage, reaching 108 (50.2%). More than half of the sample were non-alcoholics and their percentage was 194 (90.2%) and non-smokers and their percentage was 117 (54.4%) and the percentage of those who had complications of pancreatitis reached 114 (53%) and those who had symptoms of diabetes reached 59 (27.4%), and it was found that there is a real, statistically significant relationship between pancreatitis and the occurrence of diabetes as a complication of it, as the percentage of patients reached of those who had symptoms of diabetes 50 (23.3%).

Keywords: Pancreatitis; Diabetes; Pancreatitis, Symptoms

Introduction

Acute pancreatitis, an inflammatory condition of the pancreas often caused by gallstones or alcohol abuse, typical manifestations include sudden and severe epigastric pain radiating to the back, nausea and vomiting and epigastric tenderness. Chronic pancreatitis is characterized by progressive inflammation that results in irreversible damage to the structure and function of the pancreas. In recent years, the topic of post-pancreatitis diabetes mellitus PPDM, also known as type 3c diabetes, has received a lot of attention from researchers. PPDM represents long-term sequelae of pancreatitis and is the most common exocrine pancreatic disease. There is a significant lack of knowledge among practitioners about the diagnosis, complications and management of PPDM. Rapid and correct diagnosis of this condition has far-reaching implications including patient counseling, generation of better management strategies to improve blood glucose control, to decrease short-and long-term complications and to increase patient and provider satisfaction. Service, reducing burnout among treating physicians.¹

Aim of the study

Diabetes mellitus after pancreatitis is one of the most common types of secondary diabetes. In this study, we aimed to find out the percentage of patients who had secondary diabetes as a complication of pancreatitis.²

Materials and Methods

A cross-sectional study in Damascus hospital, in the department of gastroenterology included 215 cases from 2017 to 2023.

Inclusion criteria

Records of patients admitted to the division of gastroenterology.

Exclusion criteria

Archive errors, records missing information.³ Cases discharged at the patient's responsibility.

Data collection tool

A questionnaire containing several questions serving the purpose of research was prepared and included in the appendix section at the end of the study.

Obaida Thuloj, Yahya Almasri, Taghreed Hammoud

Department of Medicine, Syrian Private University, Damascus, Syria.

Corresponding author:

Obaida Thuloj

E-mail: obaida.th@hotmail.com

Received: 11 April 2023, Manuscript No. ajdm-23-100725;

Editor assigned: 14 April 2023, PreQC No. ajdm-23-100725

(PQ); Reviewed: 28 April 2023, QC No ajdm-23-100725;

Revised: 02 June 2023, Manuscript No. ajdm-23-100725 (R);

Published: 30 June 2023

Review Article

Statistical analysis: Patients data was tabulated and entered into the computer and then the statistical package for social sciences SPSS version (26) was used to analyze this data and the following statistical methods were relied upon in the analysis.

Descriptive analysis

It consists in finding the relative frequency distributions of the categorical variables of the study (gender, place of residence) and adding graphic forms to enrich the results.

Inferential analysis: This part of the analysis aims to present and interpret the results and infer them in order to reach the goal of the study, by conducting the *chi square* independence test to study whether there is a relationship between two descriptive variables, by applying the *chi square* statistic.⁴

Results

Table 1 shows the distribution of the sample, which amounted to 215 cases, according to gender, age and place of residence, where the percentage of males was 116 (54%), more than half of the sample, compared to females 99 (46%), and with regard to age, the average age of the sample was approximately 45 years with a standard deviation of 19.44. The highest recorded age was 87 years, compared to 5 years as the youngest recorded age. As for the place of residence, the governorate of Rif Dimashq had the largest percentage, reaching 108 (50.2%) and the governorate of Rif Dimashq ranked second, with a rate of 61 (28.4%), while the governorate of Homs had the lowest percentage 4 (1.4%).⁵

Table 1: The distribution of the sample, which amounted to 215 cases, according to gender.

Variables	N	%
Gender		
Male	116	54
Female	99	46
Total	215	100
Age		
Mean		45.4
Median		45
Mode		75
Std. deviation		19.44
Minimum		5
Maximum		87
Sum		9761
Place of residence		
Damascus	61	28.4
Rif Dimashq	108	50.2
Daraa	33	15.3
Al Qunaitra	5	2.3
Homs	3	1.4
Hamah	5	2.3
Total	215	100

Table 2 shows the distribution of the sample according to alcohol consumption, as more than half of the sample are

non-alcoholics, with a percentage of 194 (90.2%), compared to alcoholics, whose percentage was only 21 (9.8%).

Table 2: The distribution of the sample according to alcohol consumption.

	N	%
Is the patient alcoholic?		
No	194	90.2
Yes	21	9.8
Total	215	100

Review Article

Table 3 shows the distribution of the sample according to smoking habit. More than half of the sample were

also non-smokers, with a percentage of 117 (54.4%), compared to 96 (44.7%) of smokers.

Table 3: The distribution of the sample according to smoking habit.

	N	%
Does the patient smoke?		
No	117	54.4
Yes	96	44.7
Other	2	0.9
Total	215	100

Table 4 shows the distribution of the sample according to surgical histories, as more than half of the sample

had surgical histories and their percentage reached 120 (55.8%), compared to the rest of the sample 94 (43.7%).

Table 4: The distribution of the sample according to surgical histories.

	N	%
Is there a surgical history?		
Yes	120	55.8
No	94	43.7
Don't Know	1	0.5
Total	215	100

Table 5 shows the distribution of the sample according to their suffering from obesity, as more than half of the

sample 154 (71.6%) did not suffer from high BMI.

Table 5: The distribution of the sample according to their suffering from obesity.

	N	%
Does the patient suffer from BMI obesity?		
No	154	71.6
Yes	61	28.4
Total	215	100

Table 6 presents the family history of the study sample, where more than half of the sample had no family history, and they amounted to 153 (71.2%). As for the

family history that was recorded, high blood pressure had the largest share at a rate of 33 (15.3%) and the disease came in second place. diabetes by 25 (11.6%).^{6,7}

Table 6: The family history of the study sample.

	N	%
Is there a family history?		
No	153	71.2
Diabetes	25	11.6
Arterial hypertension	33	15.3
Hypothyroidism	1	0.5
Stomach cancer/thyroid cancer	1	0.5
Gilbert's disease	1	0.5
Asthma	1	0.5
Total	215	100

Table 7 shows the radiographic investigations used in the

context of managing a case of pancreatitis, where

Review Article

ultrasound was the most used method with a percentage of 207 (27.3%) and the ERCP came in second place with a percentage of 118 (17.50%), followed by a Chest X-Ray.

simple (CXR) with a rate of 132 (17.40%), while Magnetic Resonance Imaging (MRI) was the least used method with a rate of 7 (0.9%).

Table 7: The radiographic investigations used in the context of managing a case of pancreatitis.

	N	%
Radiographic investigations		
Echo	207	27.30%
CT	44	5.80%
MRI	7	0.90%
ERCP	118	15.50%
CXR	132	17.40%
AXR	129	17.00%
ECG	121	15.90%
Emergency laparotomy	1	0.10%
Total	759	100.00%

Table 8 shows the distribution of the sample according to the presence of medical history and more than half of the sample had suffered from medical history and their

percentage was 139 (64.7%), compared to the rest of the sample who did not suffer from medical history and their percentage was 76 (35.3%).

Table 8: The distribution of the sample according to the presence of medical history.

	N	%
Do you have a medical history?		
No	76	35.3
Yes	139	64.7
Total	215	100

Table 9 shows the distribution of the sample according to complications of pancreatitis and the percentage of those

who had complications was 114 (53%), compared to 101 (47%) who did not.

Table 9: The distribution of the sample according to complications of pancreatitis.

	N	%
Does the patient suffer from complications of pancreatitis?		
No	101	47
Yes	114	53
Total	215	100

Table 10 shows the distribution of the sample according to the appearance of diabetes symptoms after pancreatitis and more than half of the sample did not

have any symptoms and their percentage reached 156 (72.6%), compared to those who had symptoms and their percentage was 59 (27.4%).^{8,9}

Table 10: The distribution of the sample according to the appearance of diabetes symptoms after pancreatitis.

	N	%
Do you have any symptoms of diabetes after pancreatitis?		
No	156	72.6
Yes	59	27.4
Total	215	100

Table 11 shows a study of the relationship between the

occurrence of complications of pancreatitis and the emergence of symptoms of diabetes, as the significance

Review Article

of the test was less than 0.05 (P-Value<0.05), meaning that with 95% confidence there is a real, statistically significant relationship between pancreatitis and the

occurrence of diabetes as a complication for him, the percentage of patients who showed symptoms of diabetes was 50 (23.3%).^{10,11}

Table 11: A study of the relationship between the occurrence of complications of pancreatitis and the emergence of symptoms of diabetes.

	Does the patient suffer from complications of pancreatitis?		Total		
	No	Yes			
Did any symptoms of diabetes appear after pancreatitis?					
No	92 42.80%	64 29.80%	156 72.60%		
Yes	9 4.20%	50 23.30%	59 27.40%		
Total	101 47.00%	114 53.00%	215 100.00%		
<i>Chi-square tests</i>					
	Value	df	Asymptotic significance (2-sided)	Exact sig. (2-sided)	Exact sig. (1-sided)
Pearson chi-square	32.851a	1	0		
Continuity corrections	31.119	1	0		
Likelihood ratio	35.661	1	0		
Fisher's exact test				0	0
Linear-by-linear association	32.698	1	0		
N of valid cases	215				

Discussion

Unlike type 1 and type 2 diabetes, the epidemiology of PPDM was relatively unknown until the past decade, prevalence is still likely to be lower than expected and may be expected to rise with increased awareness.¹²

The prevalence of PPDM is significantly higher in men than in women in both acute and chronic pancreatitis and this was shown in the context of our study, as the incidence of males was (54%), while the incidence of females was (46%).

The small sample size may play a role in not giving accurate information about the habits followed that may have a role in the occurrence of pancreatitis, as a small percentage of the patients were alcoholics (9.8%) and less than half were smokers (44.7%).

Long-term complications of PPDM include abdominal pain, pancreatic exocrine insufficiency, malnutrition, decreased bone mineral density, pseudocysts, visceral vascular complications, diabetes mellitus and pancreatic cancer which was demonstrated in the course of our study where more than half of the patients they had complications of pancreatitis (53%).¹³⁻¹⁵

Conclusion

When studying the relationship between the occurrence of pancreatitis and the development of diabetes, it was

found that there is a real relationship with statistical significance and with confidence of 95%, as the percentage of patients who showed symptoms of diabetes reached 50 (23.3%).

It was found that less than half of the patients who suffered complications from pancreatitis suffered from symptoms of diabetes (27.4%), although there is a relationship between pancreatitis and the development of diabetes and it is likely that the small sample size also played a role in that.

Declarations Ethical Statement

The ethical consent was obtained from Syrian private university ethical committee.

Competing Interest

The authors declare no competing of interests.

Availability of Data and Materials

All data are available from the corresponding author on reasonable request.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

Reference

1. Prtrov MS. Diagnosis of endocrine disease: Post-pancreatitis diabetes mellitus: Prime time for secondary disease. *Eur J Endocrinol.* 2021;184: R137-R149.
2. Petrov MS, Basina M. Diagnosis of endocrine disease: Diagnosing and classifying diabetes in diseases of the exocrine pancreas. *Eur J Endocrinol.* 2021;184: R151-R163.
3. Woodmansey C, McGovern AP, McCullough KA, et al. Incidence, demographics and clinical characteristics of diabetes of the exocrine pancreas (type 3c): A retrospective cohort study. *Diab Care.* 2017;40:1486-1493.
4. Pendharkar SA, Mathew J, Petrov MS, et al. Age-and sex-specific prevalence of diabetes associated with diseases of the exocrine pancreas: A population-based study. *Dig Liver Dis.* 2017;49:540-544.
5. Vujasinovic M, Dugic A, Maisonneuve P, et al. Risk of developing pancreatic cancer in patients with chronic pancreatitis. *J Clin Med.* 2020;9:3720.
6. Vujasinovic M, Dugic A, Nouri A, et al. Vascular complications in patients with chronic pancreatitis. *J Clin Med.* 2021;10:3720.
7. Vujasinovic M, Dugic A, Nouri A, et al. Vascular complications in patients with chronic pancreatitis. *J Clin Med.* 2021;10:3720.
8. Petrov MS. Diagnosis of endocrine disease: Post-pancreatitis diabetes mellitus: Prime time for secondary disease. *Eur J Endocrinol.* 2021;184:R137-49.
9. Medagama AB, Bandara R. The use of Complementary and Alternative Medicines (CAMs) in the treatment of diabetes mellitus : Is continued use safe and effective? *Nutr J.* 2014;13:102.
10. Johansen JS, Harris AK, Rychly DJ, et al. Oxidative stress and the use of antioxidants in diabetes : Linking basic science to clinical practice. *Cardiovasc Diabetol.* 2005;4:5.
11. Zimmet PZ. Diabetes epidemiology as a tool to trigger diabetes research and care. *Diabetologia.* 1999;42:499-518.
12. Uprety Y, Asselin H, Boon EK, et al. Indigenous use and bio-efficacy of medicinal plants in the Rasuwa District Central Nepal. *J Ethnobiol Ethnomed.* 2010;6:3.
13. Kalekar SA, Munshi RP, Thatte UM, et al. Do plants mediate their anti-diabetic effects through anti-oxidant and anti-apoptotic actions ? an in vitro assay of 3 Indian medicinal plants. *BMC Complement Altern Med.* 2013;13:257.
14. Hjelm K, Atwine F. Health-care seeking behaviour among persons with diabetes in Uganda : An interview study. *BMC Int Health Hum Rights.* 2011;11:11.
15. Dominguez-rodriguez A, Torre- PAJM De, Julia H, et al. Effect of intravenous and intracoronary melatonin as an adjunct to primary percutaneous coronary intervention for acute ST elevation myocardial infarction: Results of the Melatonin Adjunct in the acute myocardial Infarction treated with Angioplasty trial. *J Pineal Res.* 2017;62.