

Does the Presence of Obesity and/or Metabolic Syndrome Affect the Course of Acute Pancreatitis? Prospective study

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OBJECTIVES

The incidence of acute pancreatitis (AP) is rising with increased prevalence of obesity, which exacerbates pancreatic injury.

Metabolic syndrome (MS) is defined as a cluster condition of cardiovascular risk factors, including hyperglycemia, dyslipidemia, hypertension, and central obesity.

* We analyze if the presence of obesity and/or MS affects the course of pancreatitis.

In fact, a new severity scoring system (acute physiology and chronic health evaluation-obesity)[1] was proposed to consider obesity as an independent predictor for the outcome of AP.

Obesity is associated with an increased risk of AP development; therefore, larger abdominal adiposity and higher waist circumference (WC) often accompany severe pancreatitis.

The relationship between MS criteria and pancreatic diseases remains vague.

In our study, we explored the relation between MS criteria based on the International Diabetic Federation (IDF) definition and pancreatitis and determined if obesity and body mass index (BMI) can predict pancreatitis severity

METHODS

Data were collected from 140 patients with AP between January 2010 and February 2013. Anthropometric data, including body mass index and waist circumference, were measured.

Biochemical tests were used including fasting glucose, triglyceride, low- and high-density lipoprotein cholesterol levels, and total cholesterol level.

Atlanta criteria, acute Physiology and Chronic Health Evaluation II, and Ranson scoring system were used to define severe AP. We graded the severity of pancreatitis into 5 distinct groups from A to E according to the Balthazar-Ranson grading scale[2]. The etiology, local and systemic complications of AP were also identified. Atlanta criteria were adopted to define mild AP (normal enhancement of pancreatic parenchyma on CT or if the Ranson score was less than 3), whereas severe AP was defined as presence of cardiovascular, pulmonary, renal dysfunction, and/or local complications such as necrosis, abscess, or pseudocyst.

Patients were classified as having MS based on the International Diabetic Federation criteria.

Exclusion Criteria

Patients were excluded from the study if they fell into any of the following categories: presented with recurrent pancreatitis, diabetes mellitus, hyperlipidemia or dyslipidemia, hypertension, pregnancy, presence of morbidities possibly affecting the patient's weight, such as hypothyroidism, pregnancy, alcohol consumption, history of episodes of idiopathic and chronic pancreatitis, drug-induced and pancreatic divisum, endoscopic retrograde cholangiopancreatography pancreatitis, hyperlipidemia-induced hypercalcemia-induced pancreatitis, and patients with symptoms for more than 2 days

Definition of MS

The National Heart, Lung, and Blood Institute/American Heart Association has an established IDF definition for MS that includes central obesity exceeding the standard WC (Q94 cm for men and Q80 cm for women) as an essential component, together

with at least 2 of the following 4 criteria[3]:

1. administering 150 mg/dL triglyceride or more or receiving drug treatment;
2. HDL cholesterol level of less than 40 mg/dL in men or less than 50 mg/dL in women or receiving drug treatment;
3. systolic blood pressure of 130 mm Hg and above and/or diastolic blood pressure of 85 mm Hg and above;
4. fasting blood glucose of 100 mg/dL and above.

The IDF criteria have suggested a redefinition of the MS using WC adapted for different ethnic groups[3] and recommend the use of European cutoff values for WC measurement in people in the Middle East populations.

TABLE 1. Overall Patient Characteristics (N = 140)

Patient Characteristics	Result
Age, y	
Median, mean (SD), range [minimum-maximum]	46, 48.4 (17.7), 68 [17.0-85.0]
Sex (male/female)	(60 [42.9%]/80 [57.1%])
BMI, kg/m ²	
Mean (SD), range [minimum-maximum]	30.1 (6.99), 34.2 [14.9-49.1]
Underweight	2 (1.4 %)
Normal	36 (25.7%)
Overweight	32 (22.9%)
Obese	58 (41.4%)
Morbid obesity	12 (8.6 %)
Central obesity	
WC, cm	
Mean (SD), range [minimum-maximum]	95.55 (16), 98-92 [35.0-127.0]
Etiology	
Biliary	106 (75.5%)
Unknown (idiopathic)	34 (24.3%)
Death (mortality)	4 (2.9%)
Severity of Pancreatitis	
Mild	124 (88.6%)
Severe	16 (11.4%)
Complications	
Local	13 (9.2%)
Systemic	16 (11.4%)

TABLE 2. Relationship Between Severity of Pancreatitis and Risk Factors (N = 140)

Patient Characteristics	Mild Pancreatitis (n = 124)	Severe Pancreatitis (n = 16)	χ^2
Age, y			0.031
Mean	46.7	41.2	
Median	45.8	51.5	
SD	17.3	16.1	
Sex (male/female)			0.031
Range (minimum-maximum)	68 (17.85)	59 (51-118)	
Sex (male/female)	59 (47.6%/71 (57.2%))	7 (49.7%/9 (56.2%))	0.031
Body weight, kg			0.009
Mean	73.8	78.0	
Median	75.8	79.0	
SD	15.3	11.1	
Range (minimum-maximum)	70 (49-118)	54 (55-118)	
BMI, kg/m ²			0.033
Mean	30.1	31.0	
Median	29.4	31.8	
SD	7.1	5.9	
Range (minimum-maximum)	34.2 (14.9-49.1)	15.5 (25.6-39.2)	
WC, cm			0.055
Mean	95.2	98.1	
Median	96.0	98.5	
SD	17.4	13.1	
Range (minimum-maximum)	92.0 (51-118)	47.0 (76-120)	
MS			0.051
Yes (n)	9 (9.9%)	9 (10.2%)	
No (n)	85 (68.7%)	7 (10.8%)	

Relationship between BMI and (mild/severe) pancreatitis

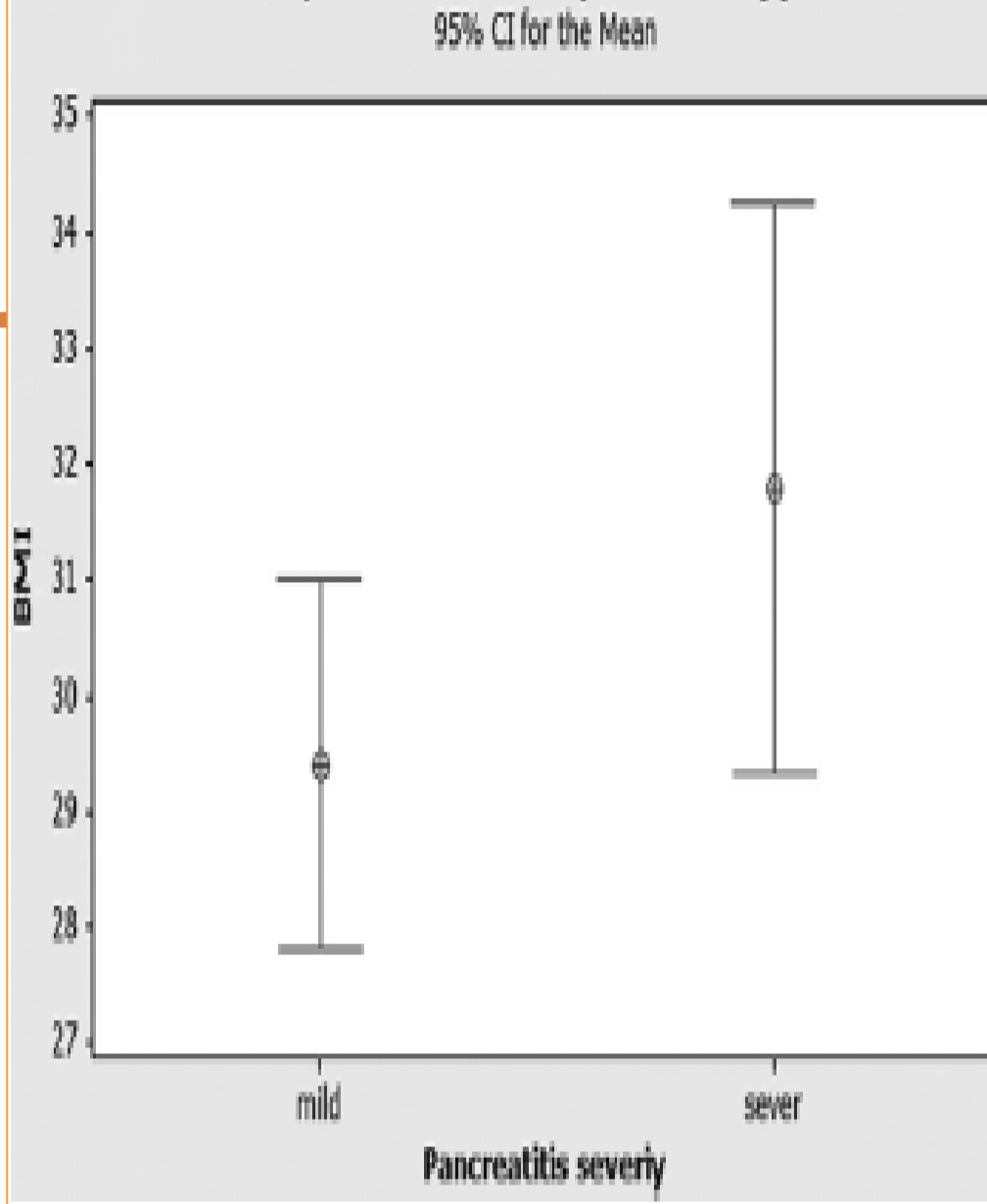


FIGURE 1. Relationship between BMI and (mild/severe) pancreatitis.

TABLE 3. Prevalence of MS in Patients With Pancreatitis (N = 140)

Factor	Criteria	Total (N = 140)	Pancreatitis (Unknown) (n = 34), n (%)	Pancreatitis (Biliary) (n = 106), n (%)	χ^2
MS	Yes	88 (62.8%)	0 (0)	88 (83)	0.000
	No	52 (37.1%)	34 (100)	18 (16.9)	
Central obesity, WC, cm	Male, \geq 94	40	8 (20.5)	32 (30.1)	0.039
	Male, <94	20	6 (17.6)	14 (13.2)	
	Female, \geq 80	70	14 (41.1)	56 (52.8)	
	Female, <80	10	6 (17.6)	4 (3.7)	
BMI, kg/m ²	Underweight	2	2 (5.8)	0 (0)	0.024
	Normal weight	36	12 (35.2)	24 (22.6)	
	Overweight	32	5 (14.7)	27 (25.4)	
	Obese class I	70	15 (44.1)	55 (51.8)	
	Obese class II				
Obese class III					

TABLE 4. Univariate Analysis Results of MS Criteria in Patients With AP (N = 140)

Factor	Criteria	Total (N = 140)	MS (Negative) (n = 52), n (%)	MS (Positive) (n = 88), n (%)	χ^2
Central obesity, WC, cm	Male, \geq 94	40	8 (15.3)	32 (36.3)	0.000
	Male, <94	20	18 (34.6)	2 (2.2)	
	Female, \geq 80	70	16 (30.7)	54 (61.3)	
Raised triglycerides, mg/dL	Female, <80	10	10 (19.2)	0 (0)	0.349
	TG \geq 150 mg/dL (1.7 mmol/L)	14	4 (7.6)	10 (11.3)	
	TG <150 mg/dL (1.7 mmol/L)	126	48 (92.3)	78 (88.6)	
Reduced HDL cholesterol level, mg/dL	Male, <40	44	20 (38.4)	24 (27.2)	0.378
	Male, \geq 40	16	6 (11.5)	10 (11.3)	
	Female, <50	62	22 (42.3)	40 (45.4)	
Raised blood pressure, mm Hg	Female, \geq 50	18	4 (7.6)	14 (15.9)	0.013
	Systolic, \geq 130	98	30 (57.6)	68 (77.2)	
	Diastolic, \geq 85	42	22 (42.3)	20 (22.7)	
Raised fasting plasma glucose, mg/dL	Systolic, <130	42	22 (42.3)	20 (22.7)	0.000
	Diastolic, \geq 85	96	26 (50)	70 (79.5)	
	Fasting blood glucose, \geq 100	44	26 (50)	18 (20.4)	
	Fasting blood glucose, <100				

CONCLUSIONS

The presence of MS in patients with pancreatitis is noticeable, but it does not affect the course of disease severity, whereas obesity correlates with pancreatitis severity. Further research is warranted to expand the details of this relationship

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