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## Metabolic syndrome and hypertension individually worsen the outcome of acute pancreatitis: a systematic review and meta-analysis

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#### AIM

### INTRODUCTION

With the obesity epidemic, the number of related health conditions have also markedly increased. As a result, the prevalence of metabolic syndrome (MS) reached 25% in western countries. In the severe form of acute pancreatitis (AP), mortality rate may be as high as 50%. Earlier studies associated the elements of MS with more complications, increased severity and mortality in AP.

Study

The aim of our meta-analysis was to identify the most important risk factors by investigating the individual and synergistic effect of MS factors on AP outcome.



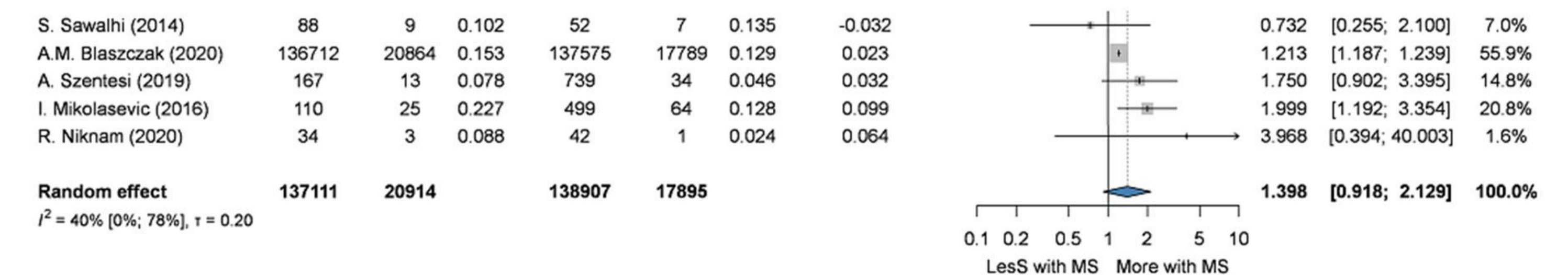
Our systematic search was performed in three databases (MEDLINE, Embase and CENTRAL) from inception to 1 November 2023. Articles were selected according to predefined eligibility criteria. We investigated the effect of four MS factors: obesity, hypertension, diabetes mellitus and hypertriglyceridemia on AP outcome. We calculated pooled odds ratios (OR) with 95% confidence intervals (CIs). Risk of bias assessment was carried out with the Quality in Prognostic Studies (QUIPS) tool. The protocol was registered in PROSPERO under number CRD42023471092.

## RESULTS

We identified 15,904 unique records, and after the selection process, 103 studies were included in our analysis. Based on the results of four articles with a total sample size of 137,000, patients with MS are more likely to have moderately severe and severe, rather than mild AP (OR=1.687, CI:0.593-4.803). The odds of developing severe AP is almost 40% increased in the MS patient group (OR=1.398, CI:0.918-2.129). The risk of mortality is also increased in the group with MS (OR=1.307, CI:0.240-7.102). When analyzed individually, hypertension was a statistically significant predictor of both mortality (OR=2.564, CI:1.392-4.723) and disease severity (OR=1.792, CI:1.399-2.296) in AP.

#### The odds of developing severe pancreatitis with vs. without metabolic syndrome

MS No MS Sample Size Event Risk Sample Size Event Risk Risk Difference OR of mild AP OR 95%-CI Weight



The odds of developing severe pancreatitis with vs. without hypertension

	Hypertension			No Hypertension							
Study	Sample Size	Event	Risk	Sample Size	Event	Risk	Risk Difference	OR of mild AP	OR	95%-Cl	Weight
S.K. Cho (2020)	124	10	0.081	199	14	0.070	0.010		1.159	[0.498; 2.697]	5.8%
V. Jain (2023)	18	8	0.444	231	73	0.316	0.128		1.732	[0.656; 4.568]	4.4%
D. Mole (2016)	595	152	0.255	1458	238	0.163	0.092		1.759	[1.396; 2.215]	77.8%
A. Szentesi (2019)	676	48	0.071	451	14	0.031	0.040		2.386	[1.299; 4.381]	11.2%
R. Niknam (2020)	27	3	0.111	49	1	0.020	0.091		6.000	[0.592; 60.786]	0.8%
Random effect	1440	221		2388	340				1.792	[1.399; 2.296]	100.0%



MS and hypertension individually worsen the outcome of AP and may serve as a clinical predictor of severity and mortality. Closer monitoring along with lifestyle counselling and education of obese AP patients is crucially important.



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