Systematic and meta-analysis of *Mycobacterium avium subsp. paratuberculosis* related type 1 and type 2 diabetes mellitus

Running title: *M. avium subsp. paratuberculosis* contributes to the risk of diabetes

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Full search strategy

1. Google scholar

Boolean/Phrase:

allintitle: paratuberculosis T1DM OR diabetes OR diabetic OR T2DM -review -case -cases -animal -mice -mouse

2. PubMed

Boolean/Phrase:

paratuberculosis[Title] AND (T1DM[Title] OR diabet*[Title] OR T2DM[Title])

Filters applied: Journal Article.

3. Web of Science Core Collection

Boolean/Phrase:

paratuberculosis AND (T1DM OR diabet* OR T2DM) (Title)

Refined By: Document Types: Articles

4. Ebscohost

Boolean/Phrase:

TI paratuberculosis AND (T1DM OR diabet* OR T2DM)

Searching: Academic Search Complete, Agricola, AHFS Consumer Medication Information, APA PsycBooks, APA PsycInfo, APA PsycTests, AtlaSerials, Religion Collection, Audiobook Collection (EBSCOhost), Business Source Complete, CAB Abstracts, CINAHL with Full Text, Communication & Mass Media Complete, eBook Collection (EBSCOhost), ERIC, Fish, Fisheries & Aquatic Biodiversity Worldwide, Global Health, GreenFILE, Health Source -

Consumer Edition, Health Source: Nursing/Academic Edition, Library, Information Science & Technology Abstracts, MasterFILE Premier, MasterFILE Reference eBook Collection, MEDLINE, MEDLINE with Full Text, Newspaper Source, OpenDissertations, Regional Business News, SocINDEX with Full Text, SPORTDiscus with Full Text, Teacher Reference Center

5. ProQuest

Boolean/Phrase:

ti(paratuberculosis AND (T1DM OR diabet* OR T2DM))

Additional limits - Document type: Article

6. Scopus

Boolean/Phrase:

TITLE ((paratuberculos* AND (t1dm OR diabet* OR t2dm)) OR ('johne's AND disease' AND (t1dm OR diabet* OR t2dm))) AND (LIMIT-TO (DOCTYPE , "ar"))
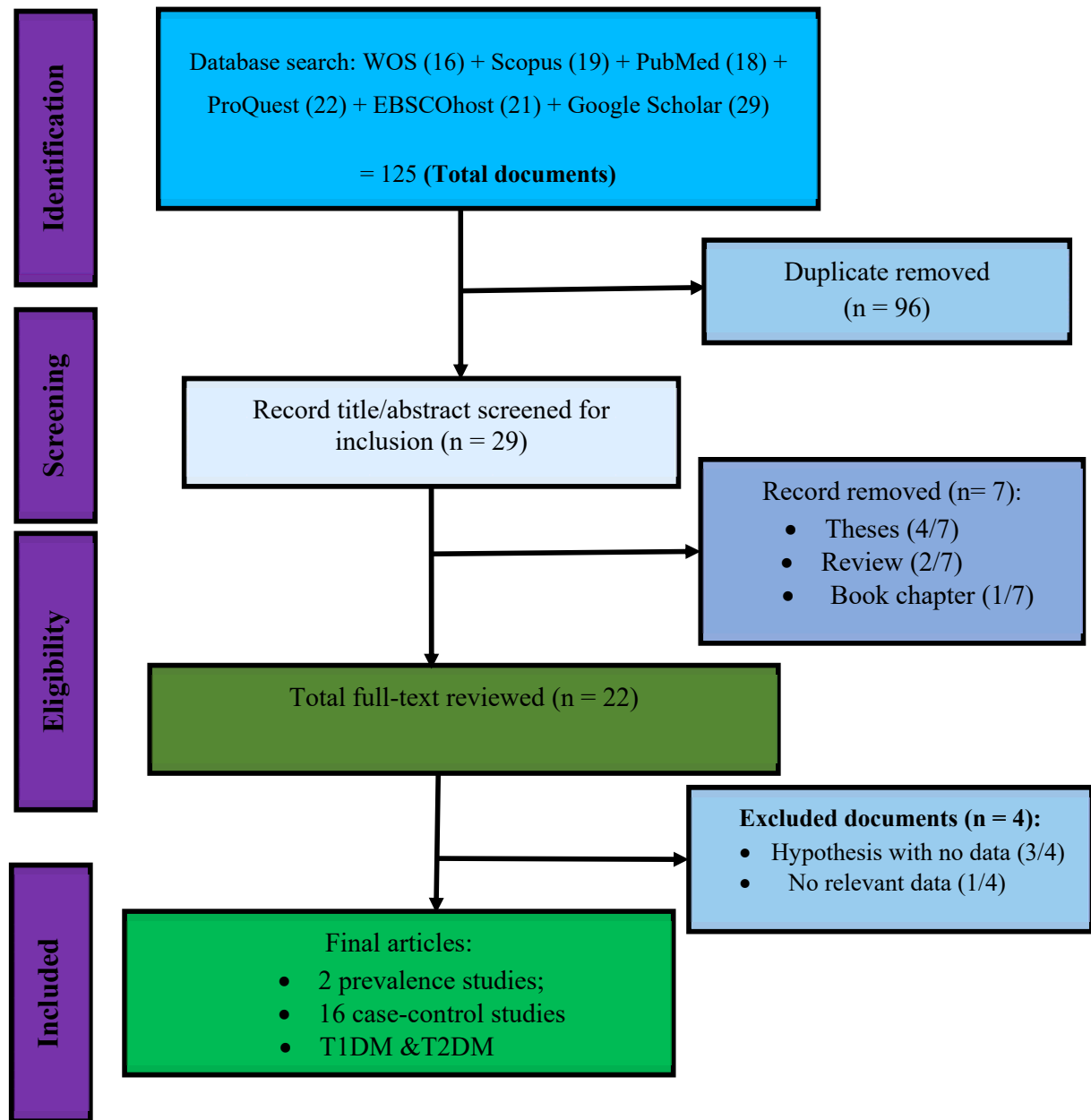
Figure S1. Schematic diagram for selecting articles on MAP-related diabetes.

T1DM = Type-1 diabetes mellitus & T2DM = Type-2 diabetes mellitus.

Table S1. Quality assessment of the included articles.

Quality category	Noli et al. 2021	Bo et al. 2019	Niegowska et al. 2016	Shariati et al. 2016	Pinna et al. 2014	A Cossu et al. 2013	Naser et al. 2013	Pinna et al. 2013	Bitti et al. 2012	A Cossu et al. 2011	Masala et al. 2011	Masala et al. 2014	Paccagnini et al. 2009	Rosu et al. 2009	Sechi et al. 2008a	Sechi et al. 2008b	%16 articles
Selection																	
1) Is the case definition adequate?:																	
a) Yes, with independent validation (one star)	2	0	2	0	2	0	0	2	0	0	0	2	0	0	2	0	**37.50**
b) Yes, e.g., record linkage or based on self report	1	1	0	1	0	1	1	0	1	1	1	0	1	1	0	1	**68.75**
c) No description	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
2) Representativeness of the cases:																	
a) Consecutive or obviously representative series of cases (one star)	2	2	2	0	2	2	2	2	2	2	2	2	2	2	2	2	**93.75**
b) Potential for selection biases or not stated	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**6.25**
3) Selection of controls:																	
a) Community controls (one star)	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2	0	**18.75**
b) Hospital controls	1	1	1	0	1	0	0	1	1	1	1	1	1	1	0	0	**68.75**
c) No description	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
4) Definition of controls:																		**0.00**
a) No history of disease (endpoint) (one star)	2	2	2	2	2	2	2	2	2	2	2	2	**2**	2	2	2	**100.00**
b) No description of source	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
Comparability																		**0.00**
1) Comparability of cases and controls on the basis of the design or analysis controlled for confounders:																		**0.00**
□ The study controls for age (one star)	2	2	2	2	2	2	0	2	0	2	2	2	1	1	0	2	**81.25**

5

□ Study controls for other factors (list)____ (one star)	2	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0	**25.00**
□ Cohorts are not comparable on the basis of the design or analysis controlled for confounders	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
Exposure																	**0.00**
1) Ascertainment of exposure:																	**0.00**
a) Secure record (e.g., surgical record) (one star)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**100.00**
b) Structured interview where blind to case/control status (one star)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
c) Interview not blinded to case/control status	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
d) Written self report or medical record only	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
e) No description	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
2) Same method of ascertainment for cases and controls:																	**0.00**
□ Yes (one star)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**100.00**
□ No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
3) Non-response rate:																	**0.00**
a) Same rate for both groups (one star)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	**12.50**
b) Non-respondents described	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
c) Rate different between cases and controls with no description	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**6.25**
	16	13	15	10	13	13	11	15	10	12	12	13	11	11	14	13	

one star = 2; quality perceived < one star = 1; absence/not Applicable = 0.

Table S2: Pcurve analysis of anti-MAP abs meta-analysis of MAP-related T1D.

	pBinomial	Full Curve		Half Curve		Evidential Value		Power Estimate
		zFull	*p*Full	zHalf	pHalf	present	Absent	
Right-Skewness Test	0.003	-8.294	<0.001	-7.687	<0.001	yes	No	94% (84.3% – 98.2%)
Flatness Test	0.982	5.264	>0.999	7.063	>0.999			