Association of autoimmune diseases and adverse pregnancy outcomes
An umbrella review

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Background

The prevalence of autoimmune conditions (AI) is twofold higher in women compared with men, especially during the reproductive years. Autoimmune conditions have been associated with a greater risk of adverse pregnancy outcomes, but this has not been examined before for a broad range of autoimmune conditions and pregnancy outcomes

Inclusion Criteria

Population: Pregnant women
Exposure: 15 Autoimmune conditions
Comparator: Presence of a control group without autoimmune conditions
Outcome: Adverse pregnancy outcomes

Medline, Embase and Cochrane library for systematic reviews
Inception-Sep.,2022

Methods

Synthesis methods: narrative & quantitative methods, pooled OR,RR
Quality assessment: AMSTAR2
Impact of overlap: corrected covered area method

Results

33 reviews included in this review

Maternal outcomes

1. Miscarriage: Sjögren's syndrome RR 8.85 (95% CI 3.10-25.26); SLE OR 4.90 (3.10-7.69); thyroid autoimmunity OR 2.70 (1.00-3.65); systemic sclerosis OR 1.60 (1.22-2.22); and coeliac disease OR 1.38 (1.12-1.69).

2. Pre-eclampsia: T1DM OR 4.19 (3.08-5.71); SLE OR 3.20 (2.54-4.20); systemic sclerosis OR 2.20 (2.10-4.53).

3. GDM: IBD OR 2.96 (1.47-5.98); thyroid autoimmunity OR 1.49 (1.07-2.07).

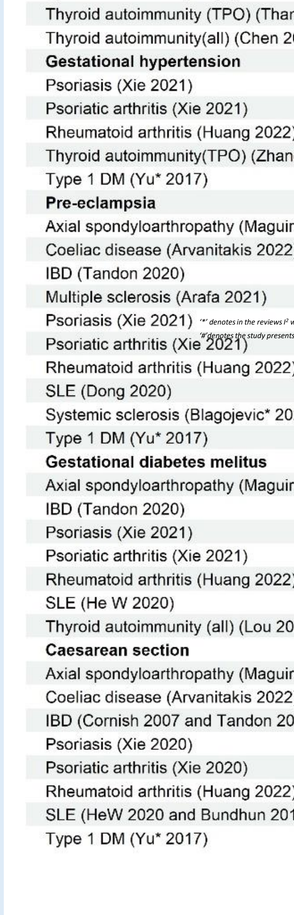
4.**CS**:T1DM OR 3.97(3.31-4.77); AxSPa OR 1.85(1.46-2.30)

Neonatal outcomes:

1. **Intrauterine growth restriction (IUGR):** systemic sclerosis OR 3.21 (2.21-4.54); coeliac disease OR1.71 (1.36-2.14).
2. **Small-for-gestational age babies:** SLE OR 2.49 (1.88-3.31); and rheumatoid arthritis OR 1.49 (1.22-1.82).
3. **Stillbirth:** T1DM OR 3.97 (3.44-4.58); IBD OR 1.57(1.06-2.32), coeliac disease OR 1.57(1.17-2.10.

The association of autoimmune conditions and maternal outcomes

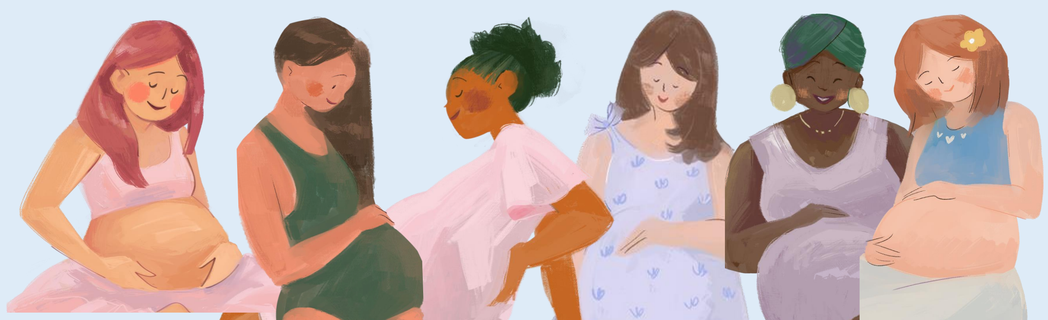
Pregnancy complication (study)	Number of studies	I-squared	OR (95% CI)
Miscarriage			
Axial spondyloarthropathy (Maguire 2020)	5	88 %	0.75 (0.03 to 19.77)
Coeliac disease (Arvanitakis 2022)	7	62 %	1.38 (1.12 to 1.69)
IBD (Tandon 2020)	3	59 %	1.63 (0.49 to 5.43)
Psoriasis (Xie 2021)	2	0 %	1.10 (1.01 to 1.20)
Psoriatic arthritis (Xie 2021)	1	0 %	1.35 (0.79 to 2.32)
Rheumatoid arthritis (Huang 2022)	2	68 %	1.16 (1.04 to 1.29)
Sjögren's syndrome (Geng# 2023)	5	53 %	8.85 (3.10 to 25.26)
SLE (He W 2020)	3	66 %	4.90 (3.10 to 7.69)
Systemic sclerosis (Blagojevic* 2020)	6	np	1.60 (1.22 to 2.22)
Thyroid autoimmunity (TPO) (Thangaratinam 2011)	30	63 %	2.74 (2.12 to 3.54)
Thyroid autoimmunity(all) (Chen 2011)	24	49 %	2.70 (1.00 to 3.65)
Gestational hypertension			
Psoriasis (Xie 2021)	3	32 %	1.49 (1.09 to 2.06)
Psoriatic arthritis (Xie 2021)	2	0 %	1.29 (1.10 to 1.67)
Rheumatoid arthritis (Huang 2022)	4	53 %	1.34 (1.07 to 1.68)
Thyroid autoimmunity(TPO) (Zhang 2016)	3	78 %	1.29 (1.15 to 1.45)
Type 1 DM (Yu* 2017)	21	np	2.68 (1.85 to 3.89)
Pre-eclampsia			
Axial spondyloarthropathy (Maguire 2020)	7	81 %	1.74 (0.85 to 3.54)
Coeliac disease (Arvanitakis 2022)	4	0 %	1.04 (0.87 to 1.21)
IBD (Tandon 2020)	2	56 %	4.65 (0.76 to 28.35)
Multiple sclerosis (Arafa 2021)	8	0 %	0.99 (0.89 to 1.09)
Psoriasis (Xie 2021)	3	63 %	1.25 (1.09 to 1.42)
Psoriatic arthritis (Xie 2021)	3	0 %	1.45 (1.13 to 1.85)
Rheumatoid arthritis (Huang 2022)	7	81 %	1.48 (1.19 to 1.83)
SLE (Dong 2020)	10	76 %	3.20 (2.54 to 4.20)
Systemic sclerosis (Blagojevic* 2020)	2	np	2.20 (2.10 to 4.53)
Type 1 DM (Yu* 2017)	10	np	4.19 (3.08 to 5.71)
Gestational diabetes melitus			
Axial spondyloarthropathy (Maguire 2020)	3	41 %	0.88 (0.24 to 3.21)
IBD (Tandon 2020)	3	51 %	2.96 (1.47 to 5.98)
Psoriasis (Xie 2021)	3	0 %	1.19 (1.09 to 1.30)
Psoriatic arthritis (Xie 2021)	5	0 %	1.26 (0.90 to 1.77)
Rheumatoid arthritis (Huang 2022)	4	53 %	1.40 (0.94 to 2.09)
SLE (He W 2020)	4	80 %	0.96 (0.56 to 1.60)
Thyroid autoimmunity (all) (Lou 2021)	18	86 %	1.49 (1.07 to 2.07)
Caesarean section			
Axial spondyloarthropathy (Maguire 2020)	12	72 %	1.85 (1.46 to 2.30)
Coeliac disease (Arvanitakis 2022)	9	0 %	1.10 (1.03 to 1.16)
IBD (Cornish 2007 and Tandon 2020)	15	75 %	1.67 (1.15 to 2.41)
Psoriasis (Xie 2020)	5	92 %	1.26 (1.05 to 1.51)
Psoriatic arthritis (Xie 2020)	4	0 %	1.45 (1.27 to 1.66)
Rheumatoid arthritis (Huang 2022)	11	85 %	1.39 (1.24 to 1.55)
SLE (HeW 2020 and Bundhun 2017)	8	92 %	1.62 (1.11 to 1.70)
Type 1 DM (Yu* 2017)	17	np	3.97 (3.31 to 4.77)



'' denotes in the reviews I^2 was not calculated but the heterogeneity was reported by Q test and presented p values, np (not provided) '#'denotes the study presents the summary estimates in Risk ratio*

Conclusion

Pregnant women with autoimmune conditions are at greater risk of developing adverse pregnancy outcomes. Further research is required to establish the pre-pregnancy protocols for counselling and screening to prevent or manage the complications of these conditions



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