

Supplementary Information

Title: Comparative Efficacy and Safety of Medical Treatments for IgG4-Related Disease: A Systematic Review and Network Meta-Analysis of Randomized Controlled Trials

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Table S1. Database-specific search strategies and search results

Database	Search formula	Result
PubMed	("Immunoglobulin G4-Related Disease"[Mesh] OR "IgG4-related disease"[tiab] OR "IgG4 related disease"[tiab] OR "IgG4-RD"[tiab] OR "immunoglobulin G4-related disease"[tiab] OR "IgG4-related systemic disease"[tiab] OR "IgG4-associated autoimmune disease"[tiab] OR "IgG4-related sclerosing disease"[tiab]) AND ("Therapeutics"[Mesh] OR therapy[sh] OR treat*[tiab] OR therap*[tiab] OR intervention*[tiab] OR management[tiab] OR glucocorticoid*[tiab] OR corticosteroid*[tiab] OR steroid*[tiab] OR prednisolone[tiab] OR prednisone[tiab] OR rituximab[tiab] OR azathioprine[tiab] OR mycophenolate[tiab] OR methotrexate[tiab] OR cyclophosphamide[tiab] OR tacrolimus[tiab]) AND ("Treatment Outcome"[Mesh] OR trial[tiab] OR cohort[tiab] OR comparative[tiab] OR prospective[tiab]) NOT (review[pt] OR systematic review[pt] OR meta-analysis[pt] OR editorial[pt] OR comment[pt] OR "Case Reports"[pt] OR "case report"[tiab] OR "case reports"[tiab] OR "case series"[tiab] OR retrospective[tiab] OR "retrospective study"[tiab] OR "retrospective studies"[tiab])	169
Web of Science	("IgG4-related disease" OR "IgG4 related disease" OR "IgG4-RD" OR "immunoglobulin G4-related disease" OR "IgG4-related systemic disease" OR "IgG4-associated autoimmune disease" OR "IgG4-related sclerosing disease") (Topic) AND (treat* OR therap* OR intervention* OR management OR glucocorticoid* OR corticosteroid* OR steroid* OR prednisolone OR prednisone OR rituximab OR azathioprine OR mycophenolate OR methotrexate OR cyclophosphamide OR tacrolimus) (Topic) AND (trial OR prospective OR comparative OR cohort OR "treatment outcome") (Topic) NOT ("case report" OR "case reports" OR "case series" OR retrospective OR "retrospective study" OR "retrospective studies" OR review OR "systematic review" OR "meta-analysis" OR editorial OR comment) (Topic)	100
Embase	('immunoglobulin g4 related disease'/exp OR 'IgG4-related disease':ti,ab,kw OR 'IgG4 related disease':ti,ab,kw OR 'IgG4-RD':ti,ab,kw OR 'immunoglobulin G4-related disease':ti,ab,kw OR 'IgG4-related systemic disease':ti,ab,kw OR 'IgG4-associated autoimmune disease':ti,ab,kw OR 'IgG4-related sclerosing disease':ti,ab,kw) AND ('therapy'/exp OR treat*:ti,ab,kw OR therap*:ti,ab,kw OR intervention*:ti,ab,kw OR management:ti,ab,kw OR glucocorticoid*:ti,ab,kw OR corticosteroid*:ti,ab,kw OR steroid*:ti,ab,kw OR prednisolone:ti,ab,kw OR prednisone:ti,ab,kw OR rituximab:ti,ab,kw OR azathioprine:ti,ab,kw OR mycophenolate:ti,ab,kw OR methotrexate:ti,ab,kw OR cyclophosphamide:ti,ab,kw OR tacrolimus:ti,ab,kw) AND (trial:ti,ab,kw OR prospective:ti,ab,kw OR comparative:ti,ab,kw OR cohort:ti,ab,kw OR 'treatment outcome'/exp) NOT ('case report'/de OR 'case report':ti,ab,kw OR 'case reports':ti,ab,kw OR 'case series':ti,ab,kw OR retrospective:ti,ab,kw OR 'retrospective study':ti,ab,kw OR 'retrospective studies':ti,ab,kw OR review:ti,ab,kw OR 'systematic review':ti,ab,kw OR 'meta-analysis':ti,ab,kw OR editorial:ti,ab,kw OR comment:ti,ab,kw)	644
Cochrane Library	([mh "Immunoglobulin G4-Related Disease"] OR "IgG4-related disease":ti,ab,kw OR "IgG4 related disease":ti,ab,kw OR "IgG4-RD":ti,ab,kw OR "immunoglobulin G4-related disease":ti,ab,kw) AND ([mh Therapeutics] OR treat*:ti,ab,kw OR therap*:ti,ab,kw OR glucocorticoid*:ti,ab,kw OR corticosteroid*:ti,ab,kw OR steroid*:ti,ab,kw OR prednisolone:ti,ab,kw OR prednisone:ti,ab,kw OR rituximab:ti,ab,kw OR azathioprine:ti,ab,kw OR mycophenolate:ti,ab,kw OR methotrexate:ti,ab,kw OR cyclophosphamide:ti,ab,kw OR tacrolimus:ti,ab,kw)	58

Table S2. Additional study details and baseline characteristics

Study	Country	Intervention treatment	Control treatment	Intervention male n	Control male n	Intervention age	Control age	RCT design
Chen et al. 2025	China	GCs + THAL	GCs cessation	9	8	NR	NR	Double-blind
Fei et al. 2019	China	GCs + MMF	GCs	25	20	55.3 (13.8)	56.8 (10.5)	Open-label, single-institution
Masamune et al. 2017	Japan	GCs	GCs cessation	22	15	63.4 (7.7)	63.1 (10.0)	Open-label, multicenter
Stone et al. 2025	International	GCs + INEB	GCs	39	49	58.2 (11.5)	58.2 (12.2)	Double-blind, multicenter
Wang et al. 2020	China	GCs + LEF	GCs	21	24	55.6 (9.9)	58.8 (12.4)	Single-blind, multicenter

GCs, glucocorticoids; THAL, thalidomide; CYC, cyclophosphamide; MMF, mycophenolate mofetil; TCZ, tocilizumab; INEB, inebilizumab; LEF, leflunomide; NR, not reported; IV, intravenous.

Table S3. Summary of certainty of evidence for key outcomes

Outcome	No. of studies	Certainty of evidence	Main reasons for downgrading
Remission	5	Low	Risk of bias and imprecision
Relapse	4	Low	Risk of bias and imprecision
Adverse events	5	Low	Risk of bias and imprecision

Figure S1. Ranking probabilities for remission

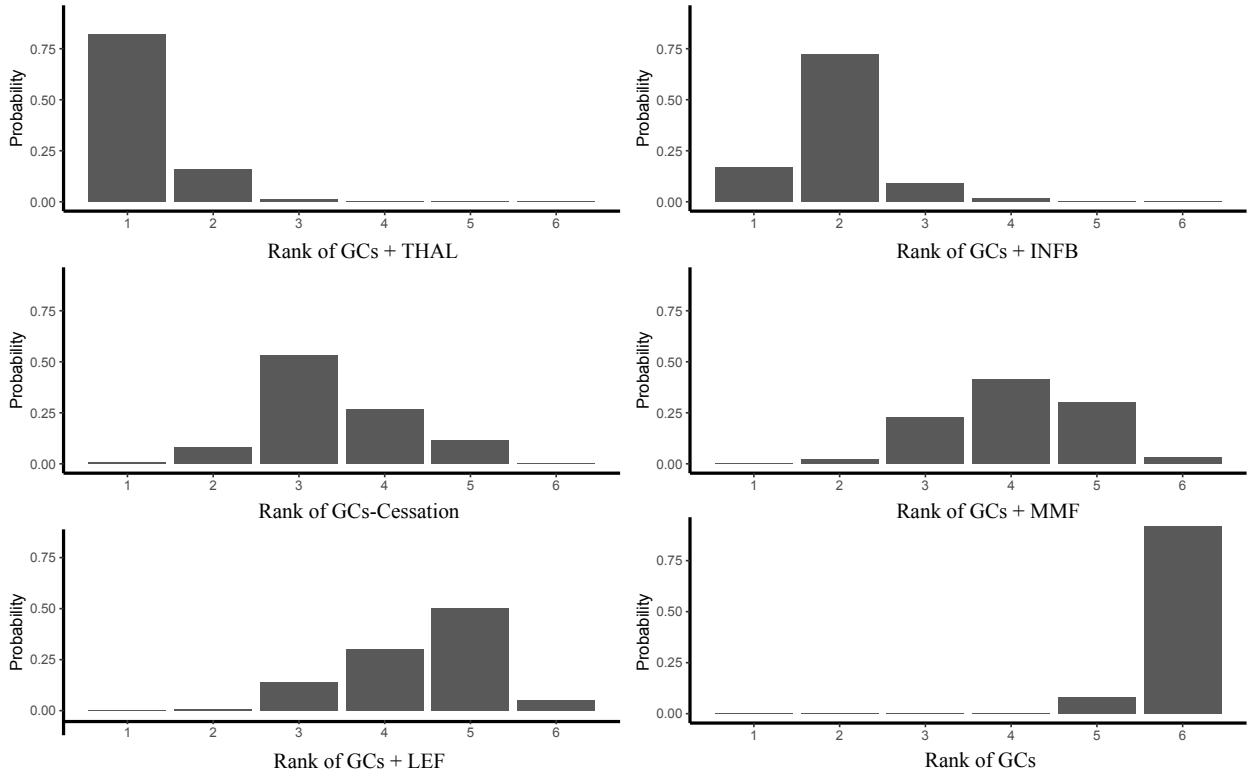


Figure S3. Odds ratios for relapse rate compared with glucocorticoids

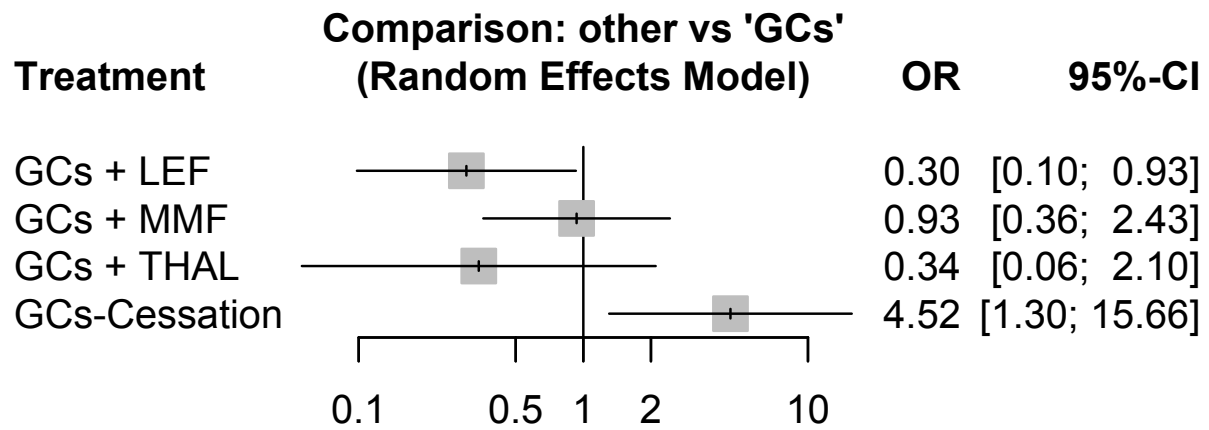


Figure S2. Ranking probabilities for relapse

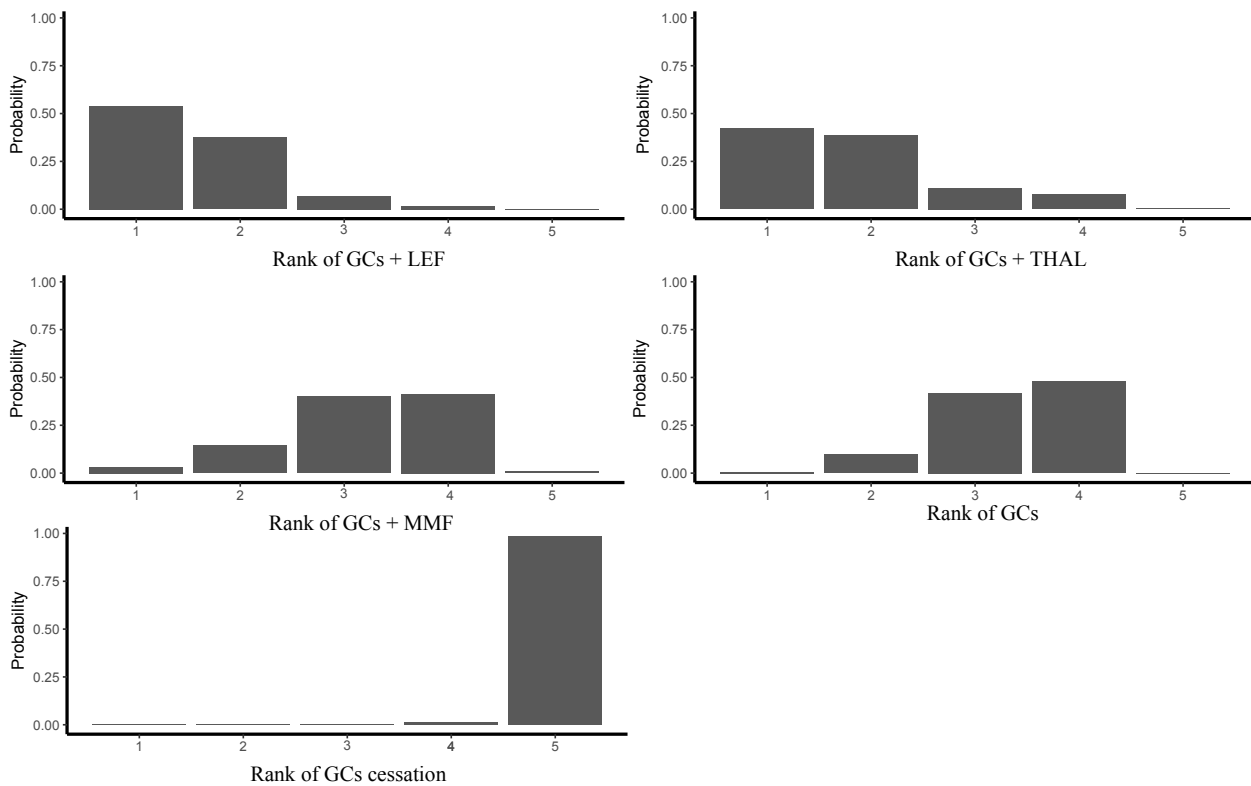


Figure S3. Ranking probabilities for adverse events

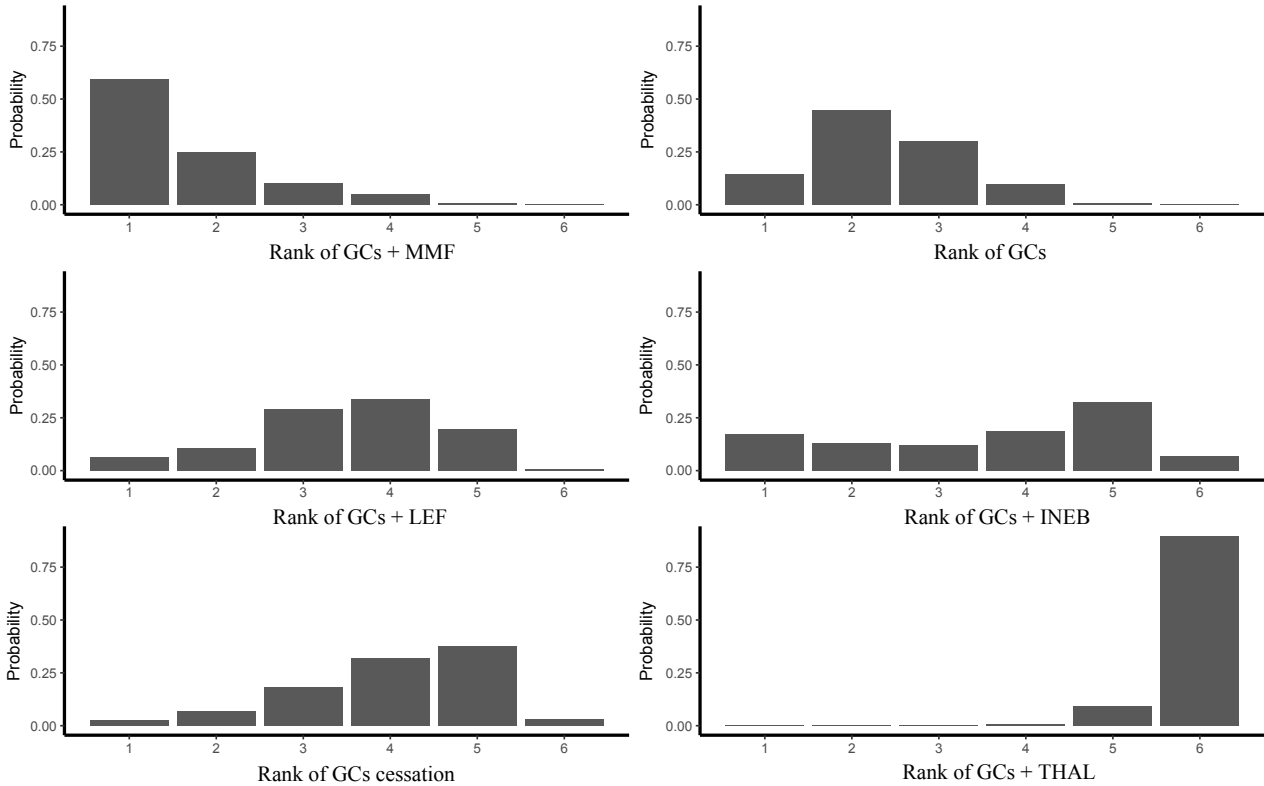


Figure S4. Risk of bias assessment for remission outcomes

	Risk of bias domains					
	D1	D2	D3	D4	D5	Overall
Chen et al. 2025						
Fei et al. 2019						
Masamune et al. 2017						
Stone et al. 2025						
Wang et al. 2020						

Domains:

D1: Bias arising from the randomization process.

D2: Bias due to deviations from intended intervention.

D3: Bias due to missing outcome data.

D4: Bias in measurement of the outcome.

D5: Bias in selection of the reported result.

Judgement

 High

 Some concerns

 Low

Figure S5. Risk of bias assessment for relapse outcomes

		Risk of bias domains					
		D1	D2	D3	D4	D5	Overall
Study	Chen et al. 2025						
	Fei et al. 2019						
	Masamune et al. 2017						
	Wang et al. 2020						
Domains:							Judgement
D1: Bias arising from the randomization process.							 High
D2: Bias due to deviations from intended intervention.							 Some concerns
D3: Bias due to missing outcome data.							 Low
D4: Bias in measurement of the outcome.							
D5: Bias in selection of the reported result.							

Figure S6. Risk of bias assessment for adverse event outcomes

	Risk of bias domains					
	D1	D2	D3	D4	D5	Overall
Chen et al. 2025						
Fei et al. 2019						
Masamune et al. 2017						
Stone et al. 2025						
Wang et al. 2020						

Domains:

D1: Bias arising from the randomization process.

D2: Bias due to deviations from intended intervention.

D3: Bias due to missing outcome data.

D4: Bias in measurement of the outcome.

D5: Bias in selection of the reported result.

Judgement

 High

 Some concerns

 Low