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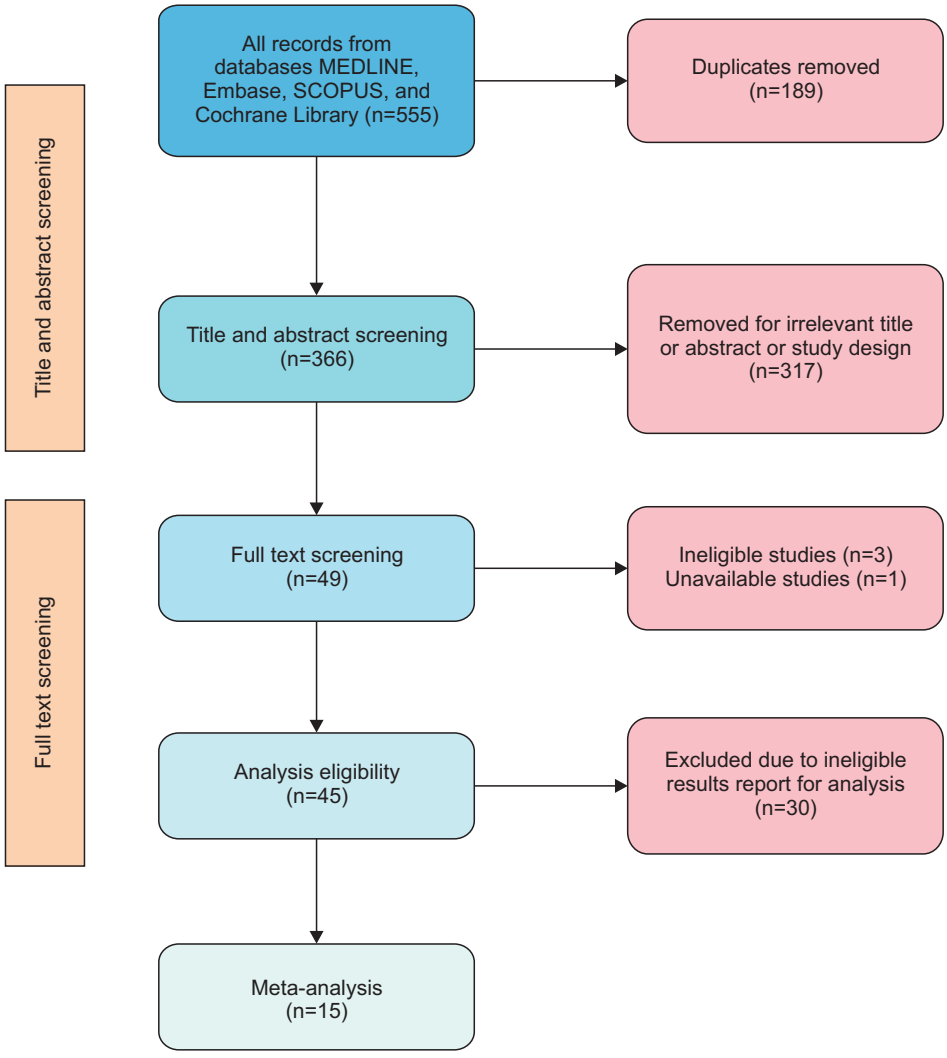
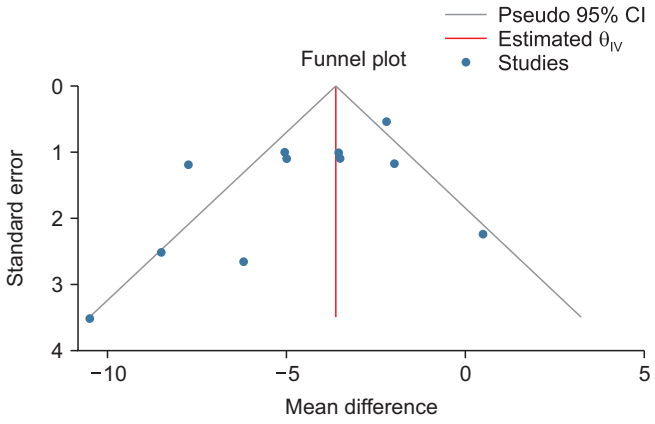


Supplementary Figure 1. Flowchart of study selection.



Supplementary Figure 2. Funnel plot of quasi-experimental studies. CI: confidence interval.

Supplementary Table 1. Search lines for each database

Database	Search line
MEDLINE	((((((((((((("Rituximab"[MeSH]) OR (CD20 Antibody, Rituximab)) OR (Rituximab CD20 Antibody)) OR (Rituxan)) OR (IDEC-C2B8 Antibody)) OR (IDEC-C2B8)) OR (Mabthera)) OR (GP2013)) OR (Rituximab)) OR (CD20 antibody rituximab)) OR (Hoffmann-La Roche brand rituximab)) OR (Roche brand rituximab)) OR (Genentech brand rituximab)) AND ((((((((((((((("Sjogren'sSyndrome"[MeSH]) OR (Sjogrens Syndrome)) OR (Sjogren's Syndrome)) OR (Syndrome, Sjogren's)) OR (Sjogren Syndrome)) OR (Sicca Syndrome)) OR (Syndrome, Sicca)) OR (Xerostomia)) OR (Hyposialia)) OR (Xerostomias)) OR (Asialia)) OR (Asialias)) OR (Mouth Dryness)) OR (Dryness, Mouth)) OR (Hyposalivation)) OR (Hyposalivations))) AND ((((((((((((case-control studies [MeSH]) OR (case-control stud* [tiab])) OR (case-comparison stud* [tiab])) OR (case-comparison [tiab])) OR (case referent [tiab])) OR (case referent stud* [tiab])) OR (retrospective stud* [tiab])) OR (case-base* [tiab])) OR (case-based* [tiab])) NOT (animals [mh] NOT humans [mh])) OR ((((((((((cohort studies [MeSH]) OR (cohort [tiab])) OR (cohort analy* [tiab])) OR (follow-up studies [MeSH])) OR (follow-up study [tiab])) OR (prospective stud* [tiab])) OR (retrospective stud* [tiab])) OR (longitudinal stud* [tiab])) OR (observational stud* [tiab])) OR (epidemiologic stud* [tiab])) NOT (animals [mh] NOT humans [mh]))) OR (((((((((randomized controlled trial [pt]) OR (randomized [tiab])) OR (placebo [tiab])) OR (drug therapy [Subheading])) OR (randomly [tiab])) OR (trial [tiab])) OR (groups [tiab])) NOT (animals [mh] NOT humans [mh]))))
Embase	('cohort study'/exp OR 'cohort studies'/exp OR 'follow-up study'/exp OR 'follow-up studies'/exp OR 'prospective study'/exp OR 'prospective studies'/exp OR 'longitudinal study'/exp OR 'longitudinal studies'/exp OR 'observational study'/exp OR 'observational studies'/exp OR 'case control study'/exp OR 'case control studies'/exp OR 'case control' OR 'case comparison' OR 'case comparison study' OR 'case comparison studies' OR 'case referent' OR 'case referent study' OR 'case referent studies' OR 'randomized controlled trial'/exp OR 'randomised controlled trial'/exp OR 'randomized' OR 'randomised' OR 'rct' OR 'clinical trial'/exp OR 'clinical trials'/exp OR 'controlled clinical trial'/exp OR 'controlled clinical trials'/exp OR 'trial'/exp OR 'trials' OR 'random allocation'/exp OR 'randomly allocated' OR 'double-blind method'/exp OR 'single-blind method'/exp OR 'crossover studies' OR 'crossover study'/exp OR 'placebo'/exp OR 'placebos'/exp OR 'random assignment' OR 'randomly assigned') AND (((((((sjogrens AND 'syndrome'/exp OR sjogrens) AND syndrome:ti,ab OR sjogren) AND syndrome:ti,ab OR syndrome,) AND sjogrens:ti,ab OR sjogren) AND syndrome:ti,ab OR sicca) AND syndrome:ti,ab OR syndrome,) AND sicca:ti,ab OR xerostomia:ti,ab OR hyposialia:ti,ab OR 'xerostomias':ti,ab OR 'asialia':ti,ab OR 'asialias':ti,ab OR 'mouth dryness':ti,ab OR 'dryness, mouth':ti,ab OR 'hyposalivation':ti,ab OR 'hyposalivations':ti,ab) AND ('rituximab'/exp OR 'cd20 antibody, rituximab':ti,ab OR 'rituximab cd20 antibody':ti,ab OR 'rituxan':ti,ab OR 'idec-c2b8 antibody':ti,ab OR 'idec-c2b8':ti,ab OR 'mabthera':ti,ab OR 'gp2013':ti,ab OR 'rituximab':ti,ab OR 'cd20 antibody rituximab':ti,ab OR 'hoffmann-la roche brand rituximab':ti,ab OR 'roche brand rituximab':ti,ab OR 'genentech brand rituximab':ti,ab)
SCOPUS	(TITLE-ABS-KEY ("Rituximab") OR TITLE-ABS-KEY ("CD20 Antibody, Rituximab") OR TITLE-ABS-KEY ("Rituximab CD20 Antibody") OR TITLE-ABS-KEY ("Rituxan") OR TITLE-ABS-KEY ("IDEC-C2B8 Antibody") OR TITLE-ABS-KEY ("IDEC-C2B8") OR TITLE-ABS-KEY ("Mabthera") OR TITLE-ABS-KEY ("GP2013") OR TITLE-ABS-KEY ("Rituximab") OR TITLE-ABS-KEY ("CD20 antibody rituximab") OR TITLE-ABS-KEY ("Hoffmann-La Roche brand rituximab") OR TITLE-ABS-KEY ("Roche brand rituximab") OR TITLE-ABS-KEY ("Genentech brand rituximab")) AND (TITLE-ABS-KEY ("Sjogren's Syndrome") OR TITLE-ABS-KEY ("Sjogrens Syndrome") OR TITLE-ABS-KEY ("Sjogren's Syndrome") OR TITLE-ABS-KEY ("Syndrome, Sjogren's") OR TITLE-ABS-KEY ("Sjogren Syndrome") OR TITLE-ABS-KEY ("Sicca Syndrome") OR TITLE-ABS-KEY ("Syndrome, Sicca") OR TITLE-ABS-KEY ("Xerostomia") OR TITLE-ABS-KEY ("Hyposialia") OR TITLE-ABS-KEY ("Xerostomias") OR TITLE-ABS-KEY ("Asialia") OR TITLE-ABS-KEY ("Asialias") OR TITLE-ABS-KEY ("Mouth Dryness") OR TITLE-ABS-KEY ("Dryness, Mouth") OR TITLE-ABS-KEY ("Hyposalivation") OR TITLE-ABS-KEY ("Hyposalivations")) AND ((TITLE-ABS-KEY ("cohort study") OR TITLE-ABS-KEY ("cohort studies") OR TITLE-ABS-KEY ("follow-up study") OR TITLE-ABS-KEY ("follow-up studies") OR TITLE-ABS-KEY ("prospective study") OR TITLE-ABS-KEY ("prospective studies") OR TITLE-ABS-KEY ("longitudinal study") OR TITLE-ABS-KEY ("longitudinal studies") OR TITLE-ABS-KEY ("observational study") OR TITLE-ABS-KEY ("observational studies")) OR (TITLE-ABS-KEY ("case-control study") OR TITLE-ABS-KEY ("case-control studies") OR TITLE-ABS-KEY ("case-control") OR TITLE-ABS-KEY ("case comparison") OR TITLE-ABS-KEY ("case-comparison study") OR TITLE-ABS-KEY ("case-comparison studies") OR TITLE-ABS-KEY ("case referent") OR TITLE-ABS-KEY ("case referent study") OR TITLE-ABS-KEY ("case referent studies")) OR (TITLE-ABS-KEY ("randomized controlled trial") OR TITLE-ABS-KEY ("randomised controlled trial") OR TITLE-ABS-KEY ("randomized") OR TITLE-ABS-KEY ("randomised") OR TITLE-ABS-KEY ("RCT") OR TITLE-ABS-KEY ("clinical trial") OR TITLE-ABS-KEY ("clinical trials") OR TITLE-ABS-KEY ("controlled clinical trial") OR TITLE-ABS-KEY ("controlled clinical trials") OR TITLE-ABS-KEY ("trial") OR TITLE-ABS-KEY ("trials") OR TITLE-ABS-KEY ("random allocation") OR TITLE-ABS-KEY ("randomly allocated") OR TITLE-ABS-KEY ("double-blind method") OR TITLE-ABS-KEY ("single-blind method") OR TITLE-ABS-KEY ("crossover studies") OR TITLE-ABS-KEY ("crossover study") OR TITLE-ABS-KEY ("placebo") OR TITLE-ABS-KEY ("placebos") OR TITLE-ABS-KEY ("random assignment") OR TITLE-ABS-KEY ("randomly assigned"))) AND (not TITLE-ABS-KEY ("animals") AND NOT TITLE-ABS-KEY ("mice") AND NOT TITLE-ABS-KEY ("rats") AND NOT TITLE-ABS-KEY ("in vitro"))

Supplementary Table 2. JBI risk of bias assessment for quasi experimental studies

Author	Year of publication	JBI results
Mirouse et al. [26]	2019	0.78
Pavlych et al. [27]	2020	0.78
Carubbi et al. [28]	2013	0.78
Mekinian et al. [29]	2012	0.75
Gottenberg et al. [30]	2013	0.5
Berardicurti et al. [18]	2022	0.78
Arends et al. [25]	2017	0.92
Pepple et al. [14]	2022	1
Meiners et al. [24]	2012	1
Mekinian et al. [17]	2012	0.85
Chen et al. [31]	2016	0.785

Supplementary Table 3. ROB2 risk of bias assessment for RCTs

Author	Year of publication	Weight	D1	D2	D3	D4	D5	Overall
Mariette et al. [23]	2022	1	+	!	+	+	!	!
Devauchelle-Pensec et al. [15]	2014	1	+	+	+	+	+	+
Bowman et al. [16]	2017	1	+	+	+	+	!	!

ROB2: Cochrane Risk of Bias 2.0, RCTs: randomized controlled trials, D1: randomisation process, D2: deviations from the intended interventions, D3: missing outcome data, D4: measurement of the outcome, D5: selection of the reported result, +: low risk, !: some concerns, –: high risk.

Supplementary Table 4. Summary of meta-analysis based on study methodologies

Study methodology	Study count	Mean ESSDAI change	95% confidence interval
RCTs	3	4.36	−5.83 to −2.89
Quasi-experimental studies	11	0.09	−0.43 to 0.61
Combined	14	1.12	−1.54 to −0.69

ESSDAI: European League Against Rheumatism Sjögren's Syndrome Disease Activity Index, RCTs: randomized controlled trials.

Supplementary Table 5. Quasi-experimental studies meta-regression model parameters

Parameter	Coefficient	Standard error	p-value	95% confidence interval
Mean disease duration	0.0099	0.020	0.632	–0.03 to 0.05
Constant	–4.7677	1.546	0.002	–7.79 to –1.73

I^2=77.27%, R-square= 0.00%, method: random effects meta-regression.

Supplementary Table 6. RCTS meta-regression parameters

Parameter	Coefficient	Standard error	p-value	95% confidence interval
Mean disease duration	−0.1568	0.41	0.70	−0.98 to 0.66
Constant	1.0481	2.65	0.69	−4.15 to 6.25

I^2=79.81%, R-square=0.00%, method: random effects meta-regression. RCTS: randomized controlled trials.

Supplementary Table 7. Combined meta-regression parameters

Parameter	Coefficient	Standard error	p-value	95% confidence interval
Mean disease duration	0.0078	0.006	0.195	–0.0039 to 0.0195
Constant	–1.6077	0.463	0.001	–2.5165 to -0.6988

I^2=89.54%, R-square=4.38%, method: random effects meta-regression.