

Appendix 1

Electronic Search strategy

Table.S1 Medline search strategy
2017

Search time: June.28th

Database: Medline 2000 to present		
Search	Query	Items found
#1	Search systemic lupus erythematosus[Title/Abstract]	43318
#2	Search SLE[Title/Abstract]	28767
#3	Search Lupus nephritis[Title/Abstract]	6644
#4	Search systemic lupus erythematosus[MeSH Terms]	53723
#5	Search lupus nephritis[MeSH Terms]	5378
#6	Search #1 OR #2 OR #3 OR #4 OR #5	68118
#7	Search pregnancy[Title/Abstract]	348771
#8	Search pregnancy outcomes[Title/Abstract]	10634
#9	Search fetal outcomes[Title/Abstract]	1751
#10	Search maternal outcomes[Title/Abstract]	1303
#11	Search gynecology[Title/Abstract]	23710
#12	Search pregnancy outcomes[MeSH Terms]	47905
#13	Search gynecology[MeSH Terms]	17432
#14	Search #7 OR#8 OR #9 OR #10 OR #11 OR #12 OR #13	82846
#15	Search #6 AND #14	533
#16	Search ("2000/01/01"[Date - Publication] : "3000"[Date - Publication])	13969667
#17	Search #15 and #16	371

Table.S2 Embase search strategy
2017

Search time: June.28th

Database: Embase 2000 to present		
Search	Query	Items found
#1	'systemic lupus erythematosus':ti ab	56522
#2	"'lupus erythematosus nephritis':ti ab"	71
#3	systemic lupus erythematosus'/exp OR 'lupus erythematosus nephritis'/exp	86733
#4	"'systemic lupus erythematosus':ti ab OR 'lupus erythematosus nephritis':ti "ab OR 'systemic lupus erythematosus'/exp OR 'lupus erythematosus nephritis'/exp"	92373
#5	"'pregnancy':ti ab"	423237
#6	"'pregnancy outcomes':ti ab"	14431
#7	"'maternal outcomes':ti ab"	1958
#8	"'fetal outcomes':ti ab"	2793
#9	"'gynecology':ti ab"	33873
#10	pregnancy'/exp	683455
#11	pregnancy outcomes'/exp	524
#12	"'pregnancy':ti,ab OR 'pregnancy outcomes':ti ab OR 'maternal outcomes':ti ab OR 'fetal outcomes':ti ab OR 'gynecology':ti "ab OR 'pregnancy'/exp OR 'pregnancy outcomes'/exp"	833425
#13	'systemic lupus erythematosus':ti,ab OR 'lupus erythematosus nephritis':ti ab OR 'systemic lupus erythematosus'/exp OR 'lupus erythematosus nephritis'/exp AND ('pregnancy':ti ab OR 'pregnancy outcomes':ti ab OR 'maternal outcomes':ti ab OR 'fetal outcomes':ti ab OR 'gynecology':ti,ab OR 'pregnancy'/exp OR 'pregnancy outcomes'/exp)	4037
#14	"'systemic lupus erythematosus':ti,ab OR 'lupus erythematosus nephritis':ti ab OR 'systemic lupus erythematosus'/exp OR 'lupus erythematosus nephritis'/exp AND ('pregnancy':ti ab OR 'pregnancy outcomes':ti ab OR 'maternal outcomes':ti ab OR 'fetal outcomes':ti ab OR 'gynecology':ti,ab OR 'pregnancy'/exp OR 'pregnancy outcomes'/exp) AND [2000-2017]/py"	2686
#15	"'"systemic lupus erythematosus':ti, ab OR 'lupus erythematosus nephritis':ti,ab OR 'systemic lupus erythematosus'/exp OR 'lupus erythematosus nephritis'/exp AND ('pregnancy':ti,ab OR 'pregnancy outcomes':ti ab OR 'maternal outcomes':ti ab OR 'fetal outcomes':ti ab OR 'gynecology':ti "ab OR 'pregnancy'/exp OR 'pregnancy outcomes'/exp) AND [2000-2017]/py AND ([chinese]/lim OR [english]/lim)"	2454

Database: Cochrane Database 2000 to present		
Search	Query	Items found
#1	systemic lupus erythematosus	1276
#2	SLE	1045
#3	Lupus nephritis	543
#4	MeSH descriptor: [Lupus Erythematosus, Systemic] explode all trees	615
#5	MeSH descriptor: [Lupus Nephritis] explode all trees	170
#6	#1 or #2 or #3 or #4 or #5	1866
#7	pregnancy	35649
#8	pregnancy outcomes	10322
#9	fetal outcomes	2945
#10	maternal outcomes	5315
#11	gynecology	18574
#12	MeSH descriptor: [Pregnancy Outcome] explode all trees	3109
#13	MeSH descriptor: [Pregnancy] explode all trees	5609
#14	MeSH descriptor: [Gynecology] explode all trees	133
#15	#7 or #8 or #9 or #10 or #11 or #12 or #13 or #14	48220
#16	#6 and #15 and kw Publication Year from 2000 (Word variations have been searched)	162

Table.S4 ClinicalTrials.gov
2017

Search time: June.28th

Database: ClinicalTrials.gov 2000 to present		
Search	Query	Items found
#1	Condition / Disease: Systemic lupus erythematosus	
#2	Condition / Disease: Lupus erythematosus	
#3	Condition / Disease: Lupus nephritis	
#4	Other terms: Pregnancy	
#5	#1 or #2 or #3	
#6	#5 and #4	16
#7	#6 with results available	1

Appendix 2

Newcastle-Ottawa Scale and result

NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE COHORT STUDIES

Note: A study can be awarded a maximum of one star for each numbered item within the Selection and Outcome categories. A maximum of two stars can be given for Comparability. (Maximum 9 stars)

Selection

1) Representativeness of the exposed cohort

- a) truly representative of the average SLE nephritis in the community *
- b) somewhat representative of the average SLE nephritis in the community *
- c) selected group of users eg nurses, volunteers
- d) no description of the derivation of the cohort

2) Selection of the non exposed cohort

- a) drawn from the same community as the nephritis cohort *
- b) drawn from a different source
- c) no description of the derivation of the non nephritis cohort

3) Ascertainment of exposure

- a) Medical records *
- b) Renal biopsies*
- c) written self report
- d) no description

4) Demonstration that outcome of interest was not present at start of study

- a) yes *
- b) no

Comparability

1) Comparability of cohorts on the basis of the design or analysis

- a) study controls for one confounder *
- b) study controls for two or more confounders **

Outcome

1) Assessment of outcome

- a) independent blind assessment *
- b) Medical records *
- c) self report
- d) no description

2) Was follow-up long enough for outcomes to occur

- a) yes *
- b) no

3) Adequacy of follow up of cohorts

- a) complete follow up -all subjects accounted for *
- b) subjects lost to follow up unlikely to introduce bias – rate of follow up > 80 % *
- c) follow up rate < 80% and no description of those lost
- d) no statement

Newcastle-Ottawa Scale adapted for cross-sectional studies

Note: A study can be awarded a maximum of one star for each numbered item within the Selection and Outcome categories. A maximum of two stars can be given for Comparability. (Maximum 8 stars)

Selection

1) Representativeness of the sample:

- a) Truly representative of the SLE nephritis in the target population. *
- b) Somewhat representative of the SLE nephritis in the target population. *
- c) Selected group of users.
- d) No description of the sampling strategy.

2) Sample size:

- a) Justified and satisfactory. *
- b) Not justified.

3) Non-respondents:

- a) Rate of sample loss. $\leq 20\%$ *
- b) Rate of sample loss. $> 20\%$
- c) No description of the rate of sample loss.

4) Ascertainment of the exposure:

- a) Medical Records. *
- b) Renal biopsies*
- c) No description of the exposure measurement tool.

Comparability

1) The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled.

- a) study controls for one confounder *

b) study controls for two or more confounders **

Outcome:

1) Assessment of the outcome:

- a) independent blind assessment *
- b) Medical records *
- c) self report
- d) no description

2) Statistical test:

- a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). *
- b) The statistical test is not appropriate, not described or incomplete.

Table S5. Assessment of cohort study quality-Newcastle Ottawa Scale

Study	Selection		Ascertainment of exposure	Outcome of interest	Comparability	Outcome		Total Score	
	Exposed cohort	Nonexposed cohort				Assessment of outcome	Length of follow-up		Adequacy of follow-up
Carmona et al.2005	*	*	*	*	*	*	*	*	8
Cavallasca et al.2008	*	*	*	*	0	*	*	*	7
Whitelaw et al.2008	*	*	*	*	0	*	*	*	7
Wagner et al.2009	*	*	*	*	0	*	*	*	7
Al Arfaj et al.2010	*	*	*	*	**	*	*	*	9
Gladman et al.2010	*	*	*	*	**	*	*	*	9
Bramham et al.2011	*	*	*	*	**	*	*	*	9
Ko et al. 2011	*	*	*	*	*	*	*	*	8
Kowk et al.2011	*	*	*	*	**	0	*	*	8

Saavedra et al.2012	*	*	*	*	0	*	*	*	7
Fatemi et al.2013	*	*	*	*	**	*	*	*	9
Madazli et al.2014	*	*	*	*	0	*	*	*	7
Lv et al.2015	*	*	*	*	**	*	*	*	9
Mbuli et al.2015	*	*	*	*	0	*	*	*	7
Ku et al.2016	*	*	*	*	0	*	*	*	7

Table S6. Assessment of cross-sectional study quality-Newcastle Ottawa Scale

Study	Selection			Comparability	Outcome		Total Score
	Representativeness of the sample	Sample size	Ascertainment of exposure Non-respondents		Assessment of outcome	Statistical test	
Teh et al.2017	*	*	*	0	*	*	6

Appendix 3 STROBE checklist

Table S7: STROBE checklist result

Study	Title and abstract	Introduction				Methods							Results						Discussion				Other information	Total
		Background / rationale	Objectives	Study design	Setting	Participants	Variables	Data sources/ measurement	Bias	Study size	Quantitative variables	Statistical methods	Participants	Descriptive data	Outcome data	Main results	Other analyses	Key results	Limitations	Interpretation	Generalisability	Funding		
Carmona et al.2005	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	17	
Cavallasca et al.2008	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	N	Y	N	N	N	Y	Y	Y	Y	N	13	
Whitelaw et al.2008	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	N	Y	N	N	N	Y	N	Y	Y	N	13	
Wagner et al.2009	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	N	16	
Al Arfaj et al.2010	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	19	
Gladman et al.2010	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	N	18	
Bramham et al.2011	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	21	
Ko et al. 2011	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	20	
Kowk et al.2011	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	19	
Saavedra et al.2012	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	19	
Fatemi et al.2013	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	19	
Madazli et al.2014	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y	N	N	N	Y	N	Y	Y	N	14	
Lv et al.2015	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	20	
Mbuli et al.2015	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	19	
Ku et al.2016	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	19	
Teh et al.2017	Y	Y	N	N	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	16	

NOTE: Y=Yes, N=NO or unclear

Appendix 4 Outcomes analyzed

Table S8. Maternal outcomes

Maternal Outcome	No of studies involved	Participants
Spontaneous abortion	9	1195
Gestational hypertension	5	507
Preeclampsia	10	930
SLE Flare	9	850
Renal Flare	4	503
Cesarean Section	5	461
PROM *	2	210
GDM *	2	308
aPL and APS	8	1012
Active disease at conception *	2	203
Proteinuria during pregnancy	3	254
SSA+	4	286
Hypocomplementemia	3	312

NOTE: aPL= antiphospholipid antibodies include lupus anticoagulant (LA), anticardiolipin antibodies (aCL) and β 2-glycoprotein I(β 2GPI); APS=Antiphospholipid syndrome was defined according to the Sapporo criteria; GDM= gestational diabetes PROM= premature rupture of membranes

*Outcome use descriptive analyses rather than meta-analysis; Reason: 1.Studies included<3; 2.Use different outcome definition

Table S9. Fetal Outcome

Fetal Outcome	No of studies involved	Participants
Live birth	15	1688
Stillbirth	9	1255
Preterm birth	13	1443
LBW/IUGR/SGA	11	1382
Neonatal lupus*	3	347
Congenital malformation *	2	257
1min-Apgar scores*	3	88

NOTE: LBW=Low birth weight; IUGR=Intrauterine growth restriction; SGA=small for gestational age;

*Outcome use descriptive analyses rather than meta-analysis; Reason: 1. Studies included<3; 2.Use different outcome definition

Table S10. Antenatal management

Antenatal Management	No of studies involved	Participants
Steroids	5	522
Antimalarials	5	522
Immunosuppressant	5	756
Aspirin *	2	162

*Outcome use descriptive analysis rather than meta-analysis; Reason: 1.Studies included<3;

Appendix 5 Outcomes used narrative analyses

Table S11. Narrative analyses: (A) Maternal outcome; (B) Fetal outcome; (C) Antenatal Management

A. Maternal Outcome

	LN		Non-LN		p value
	events	total	events	total	
PROM					
Saavedra et al.2012	4	35	3	60	0.2
Teh et al.2017	1	49	2	66	NS
GDM					
Gladman et al.2010	1	81	3	112	0.46
Teh et al.2017	1	49	0	66	NS
Active disease at conception					
Carmona et al.2005	13	54	6	54	NS
Saavedra et al.2012	9	35	4	60	0.009*

B. Fetal Outcome

	LN		Non-LN		P value
	events	total	events	total	
Neonatal lupus					
Wagner et al.2009	0	43	0	47	NS
Gladman et al.2010	1	81	3	112	0.57
Ku et al.2106	0	29	2	35	0.18
Congenital malformation					
Gladman et al.2010	3	81	0	112	NS
Ku et al.2106	0	29	2	35	0.18
1min-Apgar scores					
(Apgar score <7) Bramham et al.2011	9	43	5	63	NS
	mean±SD	total	mean±SD	total	P value

Lv et al.2015	9.8 ± 0.7	24	9.9 ± 0.6	28	0.63
Ku et al.2106	7.4±2.4	29	7.6±2.7	35	0.72

C. Antenatal Management

Aspirin	LN		Non-LN		P value
	events	total	events	total	
Bramham et al.2011	37	43	39	64	0.008*
Kowk et al.2011	0	30	3	25	0.057

NOTE: LN= SLE pregnant women with lupus nephritis; non-LN= SLE pregnant women without lupus nephritis; GDM= gestational diabetes PROM= premature rupture of membranes; NS=not significant;

*P value was <0.05 was considered significant