

Table S1. Characteristics of the case series included in the present meta-analysis.

Author/(Refs.), year	Patient characteristics	No. of patients	Age (years)	M/F	Duration	Previous treatment	CS dose	RTX dose	Concurrent treatment	T _m	Proteinuria	eGFR or Scr
Qiu <i>et al</i> (27), 2013,	Refractory LN	14	15-50	N/A	2 months-7 years	CS, other cytotoxic drugs	1 mg/kg/day	100 mg QW*4W	N/A	12	N/A	N/A
Chen <i>et al</i> (26), 2018,	Children LN	42	11.2±3.3	5/37	5.5±1.6 months	-	20.25 (10-50) mg/day	100 mg QW*4-6W	-	10	32.4±7.2 mg/kg	N
Su <i>et al</i> (28), 2012	Refractory LN	15	11±3.2	N/A	3.0±2.5 years	CS, MMF, CYC, IVIG	45±14.7 mg/day	375 mg/m ² *2, 2 weeks apart	CYC, MMF, LEFT, AZA	12	78 (5.6-163.29) mg/m ² /h	N/A
Bang <i>et al</i> (22), 2012	Refractory LN	17	32.1±8.6	N/A	4.7±3.5 years	CS, MMF, CYC, MTX, AZA, IVIG	32.4±21.7 mg/day	500-1,000 mg*2, 2 weeks apart; 375 mg/m ² QW*4	HCQ, AZA, CYC, MMF	6	N/A	N/A
Tanaka <i>et al</i> (23), 2015	Refractory LN	17	16-75	N/A	N/A	CS, CYC, MMF, ZAZ, MTX, IVIG	45.0 (35.0-55.0) mg/day	1,000 mg*4, at days 1, 15, 169,183	CYC, MMF, AZA	13	2.2 (1.4-3.8)	(41.2-101.5) ml/min/1.73 m ²
Garcia <i>et al</i> (21), 2010	Refractory LN	13	36 (19-63)	2/11	2.2 (1-5) years	CYC, MMF, AZA	20 (12.5-50) mg/day	1,000 mg*2, 2 weeks apart	N	6	1.5 (0.9-10.5) g/day	77±51 ml/min/1.73 m ²
Jónsdóttir <i>et al</i> (7), 2013	Refractory LN	25	35 (19-71)	2/23	8 (1-22) years	CS, MMF, CYC, CSA, AZA, HCQ	17 (0-40) mg/day	375 mg/m ² QW *3-4	CYC	24	3 (0.2-7.1) g/day	100 (38-351) μmol/l
Vigna-Perez <i>et al</i> (8), 2006	Refractory LN	22	32 (9-56)	3/19	5.5 (1-15) years	CS, MMF, CYC, CSA, AZA, MTX, LFM	N/A	500-1,000 g*2, 2 weeks apart	MMF, AZA, MTX	3	N/A	N/A
Sfikakis <i>et al</i> (12), 2005	Refractory LN	10	28 (19-38)	1/9	7.3 (4-11) years	CS, CYC, MMF	0.5 mg/kg/day	375 mg/m ² QW *4	N	12	4.1 (1.6-6.6) g/day	97 (76-137) ml/min/1.73 m ²
Gunnarsson <i>et al</i> (5), 2007	Refractory LN	7	30 (19-43)	0/7	10 (1-22) years	CS, CYC, MMF, AZA, CSA, HCQ	18.9 (5-50) mg/day	375 mg/m ² QW *4	CYC	6	N/A	88 (63-111) μmol/l
Lindholm <i>et al</i> (16), 2008	Refractory LN	17	39 (19-53)	2/15	7 (0.5-21) years	CS, MMF, CYC, CSA, AZA, MTX	N/A	375 mg/m ² QW *4	CYC, MMF, AZA	22	N/A	55±25 ml/min/1.73 m ²
Boletis <i>et al</i> (1), 2009	Relapse LN	10	26 (16-36)	0/10	2.5 (1.5-8) years	N/A	0.5 mg/kg/day	375 mg/m ² QW *4	MMF	38	1.5 (0.2-3.5) g/day	76±14 ml/min/1.73 m ²

Table S1. Continued.

Author/(Refs.), year	Patient characteristics	No. of patients	Age (years)	M/F	Duration	Previous treatment	CS dose	RTX dose	Concurrent treatment	T _m	Proteinuria	eGFR or Scr
Melander <i>et al</i> (10), 2009	Relapse LN	20	26 (18-37)	1/19	3 (0-12) years	CS, CYC, MMF, MTX, AZA, HCQ	N/A	375 mg/m ² QW *3-4	CYC, MMF, HCQ	22	12.4 (0.5-25) g/d	N/A
Pepper <i>et al</i> (11), 2009	Refractory LN	18	37 (23-69)	5/13	7 (0.2-20) years	CS, MMF, CYC, AZA	10 (2.5-20) mg/day	1,000 mg*2, 2 weeks apart	MMF	12	PCR324.6± 290.2 g/μmol	96.8±45.5 μmol/l
Catapano <i>et al</i> (19), 2010	Refractory LN	11	40.2±12.8	N/A	96 (6-396) months	N/A	10 (5-30) mg/day	375 mg/m ² QW *4; 1,000 mg*2, 2 weeks apart	MMF, CYC, AZA, IVIG, TAC	30	2.2 g/day	86.78±17.24 μmol/l
Chavarot <i>et al</i> (2), 2017	Membranous LN	15	37 (21-46)	2/13	1.5 (0.08-23) years	CS, MMF, CYC, HCQ	5 (0-20) mg/day	375 mg/m ² QW *4; 1,000 mg*2, 2 weeks apart	N	29	4.9 (2-28) g/g	67(67-158) ml/min/ 1.73 m ²
Condon <i>et al</i> (20), 2013	Refractory LN	50	45 (19-73)	11/ 39	N/A	CS, MMF, CYC, AZA	N/A	1,000 mg*2, 2 weeks apart	MMF	40.8	422 (175-894) mg/mmol	92 (78-130) μmol/l
Hogan <i>et al</i> (6), 2018	LN	12	13.6 (12-15)	2/10	N/A	N/A	N/A	1,000 mg/1.73 m ² *2, 2 weeks apart	MMF1200 mg/m ² /d	23.7	32 (19-67) mg/mg	71.5 (61.7-100) μmol/l
Contis <i>et al</i> (3), 2016	Refractory LN	17	36 (30-44)	3/14	12 (8-19) years	CS, CYC, MMF, MMF, AZA	20 (0-40) mg/day	375 mg/m ² QW *4, 1,000 mg*2, 2 weeks apart	MMF, HCQ, AZA	12	3 (0.65-3.8) g/day	N/A
Kotagiri <i>et al</i> (9), 2016	Refractory LN	14	33 (24-39)	3/11	N/A	N/A	N/A	375 mg/m ² *1	MMF, AZA, CYC	18	N/A	N/A
Iaccarino <i>et al</i> (13), 2015	Relapse LN	68	27.8±11.2	N/A	9.3±7.3 months	CS, CYC, MMF, MTX, AZA, IVIG, LFM	N/A	375 mg/m ² QW*4, 1,000 mg*2, 2 weeks apart	CYC	12	4.1±2.9 g/day	N/A
Tsanyan <i>et al</i> (24), 2014	Refractory LN	45	27 (23-36)	6/39	48 (1-72) months	CS, CYC, MMF, AZA, CSA, HCQ	N/A	RTX 500- 2,000 mg	N	12	N/A	N/A
Terrier <i>et al</i> (25), 2010	N/A	31	39.1±14.4	N/A	8.9±6.7 years	CS, HCQ, AZA, MMF, CYC	29.9±22.9 mg/day	375 mg/m ² QW*4, 1,000 mg*, 2 weeks apart	MMF, AZA, CYC, LFM	18	3.1±2.5 g/day	14±6 mg/l

Table SI. Continued.

Author/(Refs.), year	Patient characteristics	No. of patients	Age (years)	M/F	Duration	Previous treatment	CS dose	RTX dose	Concurrent treatment	T _m	Proteinuria	eGFR or Scr
Lateef <i>et al</i> (15), 2010	Refractory LN	7	28 (18-66)	2/5	6 (3-9) years	CS, AZA, MMF, CSA, CYC, HCQ, TAC	High-dose GC	375 mg/m ² *2, 2 weeks apart	CYC	18	4.9 (2.2-12.5) g/day	N/A
Arce-Salinas <i>et al</i> (18), 2010	Refractory LN	7	28.5 (22-64)	2/5	25.5 (6-120) months	CS, AZA, CYC, MMF, HCQ	0.5 mg/kg/ day	375 mg/m ² QW*4	CYC, MMF, AZA	24	5.4 (2.1-6.2) g/day	36 (23.8-74.8) ml/min/ 1.73 m ²
Ramos-Casals <i>et al</i> (17), 2010	Refractory LN	48	35.9±1.15	N/A	N/A	CS, CYC, MMF, MTX, AZA, IVIG	N/A	375 mg/m ² QW* 4, 1,000 mg*2, 2 weeks apart	CYC, MMF	27	N/A	N/A
Davies <i>et al</i> (4), 2013	Refractory LN	18	29 (21-45)	4/14	9 (4-18)	CS, HCQ, MMF, MTX, CYC, IVIG	N/A	1,000 g*2, 2 weeks apart	HCQ, CYC	12	419±302 mg/mmol	124±101 μmol/l
Iwata <i>et al</i> (14) 2018	Refractory LN	36	33.9±32.7	N/A	87.2±95 months	N/A	43.2±20.5 mg/day	500 mg QW*2-4, 1,000 mg*2, 2 weeks apart	CYC, MMF, CSA, TAC, IVIG	12	3.62±6.69 g/day	0.99±0.92 mg/dl
Fan <i>et al</i> (29), 2009	Refractory LN	15	29±15	N/A	51±54 months	N/A	N/A	500 mg QW*1-4	CYC, MMF, AZA	5 (3-16)	N/A	N/A

AZA, azathioprine; CS, corticosteroids; CsA, cyclosporine A; CYC, cyclophosphamide; M, male; F, female; eGFR, estimate glomerular filtration rate; HCQ, hydroxychloroquine; IVIG, immunoglobulins; LN, lupus nephritis; LFM, leflunomide; MTX, methotrexate; MMF, mycophenolate mofetil; N, none; NA, absence of data or end of follow-up; RTX, rituximab; Scr, serum creatinine; TAC, acrolimus; *2, for 2 times; *4, for 4 times; QW, once a week.

Supplementary References

1. Boletis JN, Marinaki S, Skalioti C, Lionaki SS, Iniotaki A and Sfikakis PP: Rituximab and mycophenolate mofetil for relapsing proliferative lupus nephritis: A long-term prospective study. *Nephrol Dial Transplant* 24: 2157-2160, 2009.
2. Chavarot N, Verhelst D, Pardon A, Caudwell V, Mercadal L, Sacchi A, Leonardi C, Le Guern V, Karras A and Daugas E: Rituximab alone as induction therapy for membranous lupus nephritis: A multicenter retrospective study. *Medicine (Baltimore)* 96: e7429, 2017.
3. Contis A, Vanquaethem H, Truchetet ME, Couzi L, Rigotherier C, Richez C, Lazaro E and Duffau P: **Analysis of the effectiveness and safety of rituximab in patients with refractory lupus nephritis: A chart review.** *Clin Rheumatol* 35: 517-522, 2016.
4. Davies RJ, Sangle SR, Jordan NP, Aslam L, Lewis MJ, Wedgwood R and D'Cruz DP: Rituximab in the treatment of resistant lupus nephritis: Therapy failure in rapidly progressive crescentic lupus nephritis. *Lupus* 22: 574-582, 2013.
5. Gunnarsson I, Sundelin B, Jónsdóttir T, Jacobson SH, Henriksson EW and van Vollenhoven RF: Histopathologic and clinical outcome of rituximab treatment in patients with cyclophosphamide-resistant proliferative lupus nephritis. *Arthritis Rheum* 56: 1263-1272, 2007.
6. Hogan J, Godron A, Baudouin V, Kwon T, Harambat J, Deschênes G and Niel O: Combination therapy of rituximab and mycophenolate mofetil in childhood lupus nephritis. *Pediatr Nephrol* 33: 111-116, 2018.
7. Jónsdóttir T, Zickert A, Sundelin B, Henriksson EW, van Vollenhoven RF and Gunnarsson I: Long-term follow-up in lupus nephritis patients treated with rituximab-clinical and histopathological response. *Rheumatology (Oxford)* 52: 847-855, 2013.
8. Vigna-Pérez M, Hernández-Castro B, Paredes-Saharopulos O, Portales-Pérez D, Baranda L, Abud-Mendoza C and González-Amaro R: Clinical and immunological effects of Rituximab in patients with lupus nephritis refractory to conventional therapy: A pilot study. *Arthritis Res Ther* 8: R83, 2006.
9. Kotagiri P, Martin A, Hughes P, Becker G and Nicholls K: Single-dose rituximab in refractory lupus nephritis. *Intern Med* 46: 899-901, 2016.
10. Melander C, Sallée M, Trolliet P, Candon S, Belenfant X, Daugas E, Rémy P, Zarrouk V, Pillebout E, Jacquot C, *et al*: Rituximab in severe lupus nephritis: Early B-cell depletion affects long-term renal outcome. *Clin J Am Soc Nephrol* 4: 579-587, 2009.
11. Pepper R, Griffith M, Kirwan C, Levy J, Taube D, Pusey C, Lightstone L and Cairns T: **Rituximab is an effective treatment for lupus nephritis and allows a reduction in maintenance steroids.** *Nephrol Dial Transplant* 24: 3717-3723, 2009.
12. Sfikakis PP, Boletis JN, Lionaki S, Vigklis V, Fragiadaki KG, Iniotaki A and Moutsopoulos HM: Remission of proliferative lupus nephritis following B cell depletion therapy is preceded by down-regulation of the T cell costimulatory molecule CD40 ligand: An open-label trial. *Arthritis Rheum* 52: 501-513, 2005.
13. Iaccarino L, Bartoloni E, Carli L, Ceccarelli F, Conti F, De Vita S, Ferraccioli G, Galeazzi M, Gatto M, Gerli R, *et al*: Efficacy and safety of off-label use of rituximab in refractory lupus: Data from the Italian multicentre registry. *Clin Exp Rheumatol* 33: 449-456, 2015.
14. Iwata S, Saito K, Hirata S, Ohkubo N, Nakayamada S, Nakano K, Hanami K, Kubo S, Miyagawa I, Yoshikawa M, *et al*: Efficacy and safety of anti-CD20 antibody rituximab for patients with refractory systemic lupus erythematosus. *Lupus* 27: 802-811, 2018.
15. Lateef A, Lahiri M, Teng GG and Vasoo S: Use of rituximab in the treatment of refractory systemic lupus erythematosus: Singapore experience. *Lupus* 19: 765-770, 2010.
16. Lindholm C, Börjesson-Asp K, Zengjanchi K, Sundqvist AC, Tarkowski A and Bokarewa M: **Longterm clinical and immunological effects of anti-CD20 treatment in patients with refractory systemic lupus erythematosus.** *J Rheumatol* 35: 826-833, 2008.
17. Ramos-Casals M, García-Hernández FJ, de Ramón E, Callejas JL, Martínez-Berriotxo A, Pallarés L, Caminal-Montero L, Selva-O'Callaghan A, Oristrell J, Hidalgo C, *et al*: Off-label use of rituximab in 196 patients with severe, refractory systemic autoimmune diseases. *Clin Exp Rheumatol* 28: 468-476, 2010.
18. Arce-Salinas CA, Rodríguez-García F and Gomez-Vargas JI: Long-term efficacy of anti-CD20 antibodies in refractory lupus nephritis. *Rheumatol Int* 32: 1245-1249, 2012.
19. Catapano F, Chaudhry AN, Jones RB, Smith KG and Jayne DW: Long-term efficacy and safety of rituximab in refractory and relapsing systemic lupus erythematosus. *Nephrol Dial Transplant* 25: 3586-3592, 2010.
20. Condon MB, Ashby D, Pepper RJ, Cook HT, Levy JB, Griffith M, Cairns TD and Lightstone L: Prospective observational single-centre cohort study to evaluate the effectiveness of treating lupus nephritis with rituximab and mycophenolate mofetil but no oral steroids. *Ann Rheum Dis* 72: 1280-1286, 2013.
21. Garcia-Carrasco M, Mendoza-Pinto C, Sandoval-Cruz M, Soto-Vega E, Beltran-Castillo A, Jimenez-Hernandez M, Graillet D, Gonzalez L, Rojas-Rodriguez J, Pineda-Almazana A, *et al*: Anti-CD20 therapy in patients with refractory systemic lupus erythematosus: A longitudinal analysis of 52 Hispanic patients. *Lupus* 19: 213-219, 2010.
22. Bang SY, Lee CK, Kang YM, Kim HA, Suh CH, Chung WT, Park YB, Choe JY, Kim TJ, Park YW, *et al*: Multicenter retrospective analysis of the effectiveness and safety of rituximab in Korean patients with refractory systemic lupus erythematosus. *Autoimmune Dis* 2012: 565039, 2012.
23. Tanaka Y, Takeuchi T, Miyasaka N, Sumida T, Mimori T, Koike T, Endo K, Mashino N and Yamamoto K: Efficacy and safety of rituximab in Japanese patients with systemic lupus erythematosus and lupus nephritis who are refractory to conventional therapy. *Mod Rheumatol* 26: 80-86, 2016.
24. Tsanyan ME, Soloviev SK, Radenska-Lopovok SG, Torgashina AV, Nikolaeva EV, Khrennikov YB and Nasonov EL: Clinical and morphological improvement of lupus nephritis treated with rituximab. *Folia Med (Plovdiv)* 56: 245-252, 2014.
25. Terrier B, Amoura Z, Ravaut P, Hachulla E, Jouenne R, Combe B, Bonnet C, Cacoub P, Cantagrel A, de Bandt M, *et al*: Safety and efficacy of rituximab in systemic lupus erythematosus: Results from 136 patients from the French autoimmunity and rituximab registry. *Arthritis Rheum* 62: 2458-2466, 2010.
26. Chen J: Clinical efficacy and safety of low-dose rituximab combined with glucocorticoid in children with lupus nephritis. *Journal of Trauma and Emergency* 6, 2018.
27. Qiu ML, Jin O and Fang LK: Analysis of the effect of small dose of rituximab in the treatment of systemic lupus erythematosus. *China Foreign Medical Treatment* 32, 2013.
28. Su GX, Wu FQ, Wang F, Zhou ZX, Huang XL and Lu J: Rituximab therapy for severe pediatric systemic lupus erythematosus. *Zhonghua Er Ke Za Zhi* 50: 697-704, 2012 (In Chinese).
29. Fan ZY, Cai YB, Gu YY, Yang CD, Bao CD and Ye S: Efficacy of rituximab in patients with refractory severe systemic lupus erythematosus. *Chinese Remedies & Clinics*. 9, 2009.