Oral glucocorticoid patterns use in moderate to severe active SLE: insights from the Spanish SPOCS data

Iñigo Rua-Figueroa [ORCID],[1] Ricard Cervera,[2] Mercedes Freire-González,[3] Ana Isabel Turrión Nieves [ORCID],[4] Josefina Cortés-Hernández,[5] Iván Castellvi,[6] Julia Barbado Ajo,[7] Tarek Salman,[8] Jaime Calvo Alén [ORCID],[9] Nuria Lozano-Rivas,[10] Norberto Ortego-Centeno,[11] Monserrat Diaz-Encarnación,[12] Bo Ding [ORCID],[13] Marta Galvez-Fernandez [ORCID],[14] Noemí Bahamontes-Rosa,[14] José María Pego-Reigosa [ORCID],[15] the Spanish SLE Prospective Observational Cohort Study (SPOCS)

Correspondence to
Dr Ana Isabel Turrión Nieves; anaturrion@usal.es

INTRODUCTION

The unpredictable nature of the SLE disease activity makes its management particularly challenging. Current treatment options for SLE focus on managing the inflammatory status, decreasing the symptoms and reducing the frequency and severity of flares. Glucocorticoids (GCs) are a common and still essential treatment for SLE due to their rapid and potent anti-inflammatory and immunosuppressive effects. However, prolonged GC use is linked to various adverse events like infections, osteoporosis, avascular necrosis, cataracts and diabetes, contributing crucially to organ damage.[1] Consequently, the most recently updated European Alliance of Associations for Rheumatology (EULAR) recommendations for the management of SLE advocate for using the lowest possible prednisone-equivalent GC dose (≤5.0 mg/day) and discontinuing use when feasible, emphasising the importance of GC-sparing agents, such as biologics or immunosuppressives.[1]

This study aims to describe GC use in the Spanish population of SLE patients included in the multicentre SLE Prospective Observational Cohort Study (SPOCS; NCT03189875).[2]

METHODS

SPOCS is an international, multicentre, prospective cohort study to longitudinally analyse patients with moderate-to-severe active SLE, defined as a Systemic Lupus Erythematosus Disease Activity Index 2000 (SLEDAI-2K) score ≥4 (excluding urine, lab results, immunologic measures and lupus headache) or ≥6.[2] This analysis included patients from 18 centres in Spain, with biannual follow-ups for up to 3 years (2017–2019).

The study assessed demographics (sex, age) and clinical characteristics (age at SLE diagnosis and disease duration). Interferon (IFN) signature was measured using the QIAGEN therascreen IFN-inducible gene expression Rotor-Gene Q real-time PCR (RT-PCR) system and compared with a predefined cut-off to classify patients as IFN-high or IFN-low.

At baseline, disease activity was assessed using the SLEDAI-2K, clinical SLEDAI-2K and modified SLEDAI-2K scores. Organ damage was recorded using the Systemic Lupus International Collaborating Clinics/American College of Rheumatology Damage Index (SDI). SLE flares were defined using the Safety of Estrogens in Lupus National Assessment-SLEDAI Flare Index. The Physician Global Assessment (PGA) score was also measured.

SLE treatments use was recorded in an electronic database throughout follow-up. Annual cumulative oral GC (OGC) dose was calculated as the total OGC received in the previous 365 days for each time point. The OGC daily dose was categorised into three intervals: >0 to ≤5 mg/day, >5 to ≤7.5 mg/day and >7.5 mg/day.

RESULTS

The analyses included 99 participants with a mean age of 45 years, 91.9% of whom were female (online supplemental table 1). The mean age at SLE diagnosis was 33.4 years, with a mean disease duration of 11.6 years. A high IFN signature was found in 77.5%

Table 1 OGC dose and proportion of patients taking OGC over time

| OGC dose | Time point (months), N (%) | | | | | | |
	Baseline (N=71)	6 months (N=64)	12 months (N=40)	18 months (N=26)	24 months (N=28)	30 months (N=25)	36 months (N=26)
Mean, mg/day (SD)	5.4 (4.64)	8.2 (6.02)	8.8 (6.36)	10.2 (7.74)	9.4 (6.88)	9.2 (6.95)	7.3 (3.68)
By dose category							
>0 to ≤5 mg/day	30 (42.3)	33 (51.6)	19 (47.5)	11 (42.3)	11 (39.3)	11 (44.0)	14 (53.8)
>5 to ≤7.5 mg/day	26 (36.6)	6 (9.4)	3 (7.5)	2 (7.7)	2 (7.1)	2 (8.0)	4 (15.4)
>7.5 mg/day	15 (21.1)	25 (39.1)	18 (45.0)	13 (50.0)	15 (53.6)	12 (48.0)	8 (30.8)
Duration of patients taking OGC average daily dose >5 mg/day, mean (SD), days	355.0 (32.6)	–	185.7 (12.1)	–	191.9 (28.1)	–	212.42 (70.8)
Duration of patients taking OGC average daily dose >7.5 mg/day, mean (SD), days	359.7 (19.6)	–	186.3 (13.1)	–	187.4 (20.9)	–	204.75 (64.3)

OGC, oral glucocorticoids.

of participants. Mean SLEDAI-2K scores were: total 10.8, clinical 8.5 and partial 6.5. In the 6 months before recruitment, 41.4% had at least one flare. The mean SDI was 1.1, with 45.5% experiencing organ damage and the mean PGA was 1.8. Hydroxychloroquine was the most prescribed medication (87.9%), followed by OGC (71.7%), immunosuppressants (50.5%) and biologics (17.2%; online supplemental table 2).

Over the study period, the mean annual cumulative OGC dose generally increased. At baseline, it was 1980.99 mg, rising significantly to 2994.75 mg at 12 months and 3322.90 mg at 24 months before decreasing to 2632.79 mg at 36 months (online supplemental figure 1). Mean daily OGC dose followed a similar pattern: 5.4 mg/day at baseline, 8.8 mg/day at 12 months, 9.4 mg/day at 24 months and 7.3 mg/day at 36 months.

The percentage of patients with an average daily OGC dose >0 to ≤5 mg/day increased from 42.3% at baseline to 47.5% at 12 months, 39.3% at 24 months and 53.8% at 36 months (table 1). Conversely, those taking >5 to ≤7.5 mg/day declined from 36.6% at baseline to 7.5% at 12 months, 7.1% at 24 months and 15.4% at 36 months. Patients taking >7.5 mg/day increased from 21.1% to 45.0% at 12 months, peaking at 53.6% at 24 months before dropping to 30.8% at 36 months, remaining above baseline.

Among the 17.2% of patients on biologics at baseline (rituximab and belimumab), mean OGC doses were higher than the overall sample (6.4 mg/day vs 5.4 mg/day; online supplemental figure 2). Patients on belimumab (N=10) had a mean dose of 6.8 mg/day, while those on rituximab (N=3) had 5.3 mg/day. By the end of biological treatment, mean OGC doses increased to 10 mg/day (vs 6.4 mg/day at baseline), with belimumab patients (N=7) at 10.0 mg/day and rituximab patients (N=2) at 10.2 mg/day.

DISCUSSION

This study analyses the Spanish subcohort of SPOCS, a prospective observational study evaluating clinical outcomes in patients with moderate-to-severe active SLE. The findings reveal that despite alternative treatments, around half of the patients taking GC used doses exceeding 5 mg/day, surpassing the 2023 EULAR recommendations.[1] A similar pattern emerged when examining mean daily GC doses, with a significant proportion of patients exceeding 7.5 mg/day, the threshold set by earlier guidelines.[3]

For an international comparison, the Spanish cohort (71.7% receiving GCs at baseline, mean daily dose 5.4 mg and 21.1% exceeding 7.5 mg/day) showed higher GC use than the full SPOCS cohort (826 patients from North America, Europe and Australia), where 65.0% received GCs at baseline, with a mean daily dose of 6.0 mg and 15.5% exceeding 7.5 mg/day.[2] It should be noted that the observed increase in GCs use following baseline in SPOCS population is consistent with the natural history of active SLE and reflects the dynamic therapeutic adjustments common in real-world clinical practice.

These findings underscore the widespread use of GCs in Spain for moderate-to-severe SLE and suggest a similar reliance on GCs compared with the broader SPOCS population. SPOCS cohort highlights the continued use of GCs in SLE management across Western countries, emphasising the need for better adherence to guidelines to minimise long-term GC risks.

This study reinforces the urgency of developing effective strategies to reduce GC dependence. Priority should be given to therapies that control disease activity while enabling the gradual reduction of GCs in patients with moderate-to-severe SLE.

Author affiliations
[1]Rheumatology, Complejo Hospitalario Doctor Negrin, Las Palmas de Gran Canaria, Spain
[2]Hospital Clinic of Barcelona, Barcelona, Spain
[3]Rheumatology, University Hospital Complex of A Coruña, A Coruña, Spain
[4]Department of Rheumatology, Hospital Universitario de Salamanca, Salamanca, Spain
[5]Rheumatology Department, Hospital Vall d'Hebron, Barcelona, Spain
[6]Department of Rheumatology, Hospital Universitari de Santa Creu i Sant Pau, Barcelona, Spain
[7]Internal Medicine, Rio Hortega University Hospital, Valladolid, Spain
[8]Hospital del Mar, Barcelona, Spain
[9]Rheumatology, Hospital Universitario Araba, Vitoria-Gasteiz, Spain
[10]Department of Rheumatology, Hospital Clínico Universitario Virgen de la Arrixaca, El Palmar, Spain
[11]Autoimmune Diseases Unit, Hospital de Especialidades San Cecilio, Granada, Spain
[12]Department of Nephrology, Fundación Puigvert, Barcelona, Spain
[13]AstraZeneca Sweden, Mölndal, Sweden
[14]Medical Department, AstraZeneca Farmacéutica Spain, Madrid, Spain
[15]Rheumatology, Inst Invest Biomed Vigo Spain, Vigo, Spain

X Iñigo Rua-Figueroa @iruafer@gobiernodecanarias.org

ORCID iDs
Iñigo Rua-Figueroa http://orcid.org/0000-0002-7894-1690
Ana Isabel Turrión Nieves http://orcid.org/0000-0003-4825-9161
Jaime Calvo Alén http://orcid.org/0000-0001-9378-8412
Bo Ding http://orcid.org/0000-0001-9131-4563
Marta Galvez-Fernandez http://orcid.org/0000-0003-1996-7425
José María Pego-Reigosa http://orcid.org/0000-0003-3461-3537

REFERENCES

1 Fanouriakis A, Kostopoulou M, Andersen J, *et al*. EULAR recommendations for the management of systemic lupus erythematosus: 2023 update. *Ann Rheum Dis* 2024;83:15–29.
2 Aringer M, Arnaud L, Furie RA, *et al*. Real-world treatment patterns and clinical characteristics in patients with moderate-to-severe systemic lupus erythematosus: an analysis of the SLE Prospective Observational Cohort Study (SPOCS). *Lupus Sci Med* 2025;12:e001336.
3 Fanouriakis A, Kostopoulou M, Alunno A, *et al*. 2019 update of the EULAR recommendations for the management of systemic lupus erythematosus. *Ann Rheum Dis* 2019;78:736–45.