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ECONOMIC EVALUATION OF NEUROPSYCHIATRIC (NP) LUPUS IN AN INTERNATIONAL INCEPTION COHORT USING A MULTISTATE MODEL APPROACH

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Background Little is known about the economic burden of NP lupus. We estimated direct and indirect costs (DC, IC) associated with NP events attributed to SLE and non-SLE causes using multistate modelling.

Methods Patients fulfilling ACR classification criteria for SLE from 31 centres in 11 countries were enrolled within 15 months of diagnosis. NP events were documented annually using ACR NP definitions and attributed to SLE or non-SLE causes. At each assessment and for SLE and non-SLE events, patients were stratified into 1 of 3 NP states (no, resolved, or new/ongoing NP event). The change in NP status characterized by transition rates between states was analyzed using multistate modelling (doi:10.1002/art.41876).

At each assessment, annual DC and IC were based on health resource use and lost work-force/non-work-force productivity over the preceding year. Resource use was costed using 2021 Canadian prices and lost productivity using Statistics Canada age-and-sex specific wages. Costs associated with SLE and non-SLE NP states were calculated by averaging all observations in each NP state. Multiple regressions adjusted for possible confounding of age at diagnosis, sex, race/ethnicity, disease duration, geographic region, education, and smoking on the association of annual DC and IC and NP state. 5 and 10-year cumulative costs for NP states were predicted by multiplying adjusted annual costs for each state by the expected state duration, forecasted using multistate modelling.

Abstract 1124 Table 1 Predicted Annual and 5 and 10-Yr Direct and Indirect Costs (in 2021 Canadian dollars) Stratified by (a) SLE and (b) Non-SLE NP States*

(a) SLE NP States		State 1**	State 2	State 3	Difference State 1 & 2	Difference State 1 & 3	Difference State 2 & 3
Direct Costs***	1 year	6715	9020	10809	2304 (−2439, 7048)	4093 (114, 8072)	1789 (−3769, 7346)
	5 years	35567	45782	52060	10215 (−12590, 33020)	16493 (−4056, 37041)	6278 (−20421, 32976)
	10 years	72307	91193	99496	18886 (−25576, 63348)	27188 (−14884, 69261)	8302 (−43120, 59725)
Indirect Costs****	1 year	24805	25133	34939	328 (−5191, 5846)	10134 (4310, 15958)	9806 (3024, 16589)
	5 years	136970	138257	172674	1287 (−25270, 27844)	35704 (7705, 63702)	34417 (2800, 66033)
	10 years	289343	293639	339156	4296 (−48915, 57506)	49813 (−5662, 105287)	45517 (−15111, 106145)
(b) Non-SLE NP States		State 1	State 2	State 3	Difference State 1 & 2	Difference State 1 & 3	Difference State 2 & 3
Direct Costs***	1 year	6401	8225	8868	1824 (−1412, 5059)	2467 (−676, 5610)	644 (−3117, 4404)
	5 years	34587	41847	44002	7259 (−9411, 23930)	9414 (−6907, 25736)	2155 (−16778, 21088)
	10 years	70890	83515	86262	12625 (−22051, 47301)	15372 (−18829, 49574)	2747 (−35895, 41390)
Indirect Costs****	1 year	22866	28195	34225	5330 (466, 10193)	11359 (6000, 16717)	6029 (428, 11630)
	5 years	131194	151794	171979	20599 (−3717, 44915)	40785 (14979, 66591)	20186 (−6291, 46662)
	10 years	279874	316701	342434	36827 (−13437, 87091)	62560 (10663, 114457)	25733 (−26882, 78348)

*Values are the mean (95% CI).

** State 1 = no NP event; State 2 = resolved NP event; State 3 = new/ongoing NP event.

*** Adjusted for age at diagnosis, race/ethnicity, and disease duration as the other predictors (sex, region, education, and smoking) were not significant.

**** Adjusted for sex, race/ethnicity, disease duration, region, education, and smoking as the other predictor (age at diagnosis) was not significant.

Boldface indicates differences which are significant as the 95% CI does not include 0.

Results 1697 patients (89% female, 51% non-Caucasian race/ethnicity, mean age at enrolment 35.1 years) were followed a mean of 8.8 years. 1971 NP events occurred in 956 patients, 32% attributed to SLE. For SLE NP events, annual DC were higher in those with new/ongoing vs no events (\$10,809 vs \$6715) (table 1). Annual and 5-yr IC were higher in new/ongoing vs no events and new/ongoing vs resolved events (5-yr: new/ongoing vs no: \$172,674 vs \$136,970). For non-SLE NP events, annual IC were higher in new/ongoing vs no events, new/ongoing vs resolved events, and resolved vs no events and 5 and 10-yr IC were higher in new/ongoing vs no events (10-yr: new/ongoing vs no: \$342,434 vs \$279,874). For all NP states, IC exceeded DC 2.8 to 4-fold.

Conclusion IC are 1.3-fold higher in patients with new/ongoing vs no NP events. While DC trended higher in new/ongoing events, they were not significantly higher across all NP states and times. Impaired productivity associated with ongoing and resolved NP lupus is substantial, contributing to the previously documented reduced quality of life.

1200 - COVID-19

1201 FLARES AFTER SARS-COV-2 VACCINATION IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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Background Vaccination against SARS-CoV-2 is particularly important for patients with systemic lupus erythematosus

(SLE), who may be at increased risk of hospitalization for COVID-19. However, the most common reason for vaccine refusal in patients with SLE is fear of SLE disease flare. Additionally, SARS-CoV-2 mRNA vaccines could potentially induce interferon production, associated with increased SLE disease activity. Thus far, no population-based data exist regarding whether SARS-CoV-2 vaccines trigger SLE flares.

Methods We e-mailed a survey on March 5, 2021 to 7,094 outpatients evaluated in our Rheumatology Division in New York City, to assess vaccination outcomes. ICD-10 algorithms identified patients with SLE. A self-reported disease flare was defined as 'a sudden worsening of your rheumatology condition or arthritis' within two weeks of the vaccine dose.

Results As of March 30, 2021, 2714 rheumatology patients responded (36.2%). 136/466 (29.2%) patients with SLE (mean [SD] age 54.7 [13.9] years; 93.4% female; 67.7% White; 13.2% Hispanic/Latinx) reported receiving at least one COVID-19 vaccine dose. Eighty-one patients (59.6%) received Pfizer, 48 (39.3%) received Moderna, and 4 (2.9%) received Janssen. Of patients receiving Pfizer or Moderna, 72 (54.5%) received 2/2 doses. Twelve patients (8.8%) reported SLE flare within two weeks of any COVID-19 vaccination (table 1). Patients reporting SLE flare were older (59.0 [14.0] versus 54.3 [13.9] years) and White (83.3% versus 61.1%). Flares occurred in 12.5% of patients receiving Moderna and 7.4% receiving Pfizer (6 patients each). Out of 7 patients receiving both vaccine doses and who reported a flare, 2 flared after both doses (table 1).

Of the 14 flares, 9 occurred after the first dose, and 5 occurred after the second dose. Most flares after the first vaccine dose were mild (77.8%), whereas most after the second were moderate (60%). 12/14 flares (85%) were described as 'typical', predominantly characterized by joint pain, muscle aches, and fatigue. While 8/14 flares started 1 day after vaccination, 4/14 started 4-7 days later. Most SLE flares resolved

Abstract 1201 Table 1 Characteristics of Self-Reported Flares* After COVID-19 Vaccination Among Outpatients with Systemic Lupus Erythematosus

Study ID	Vaccine Manufacturer	Flare Onset (Days after vaccine dose)	Flare Severity (Mild, Moderate, Severe)	"Typical" Flare	Flare Duration (in days)	Flare Symptoms**							
						Fever	Joint pain	Joint swelling	Skin rash	Fatigue	Muscle aches	Other	Other Symptoms
Flare After Vaccine Dose #1													
1	Moderna	1 days	Mild	Yes	1 days	0	1	0	0	1	1	1	Mouth sores
2	Pfizer	1 days	Moderate	Unknown	4 days	1	1	0	0	1	1	0	
3	Moderna	1 days	Mild	Yes	4 days	0	1	1	0	0	0	0	
4	Pfizer	1 days	Severe	Yes	20 days	0	1	0	0	1	0	1	Brain fog
5	Moderna	1 days	Mild	Yes	21 days	0	1	0	1	1	1	0	
6	Moderna	3 days	Mild	Yes	22 days	1	0	0	0	1	0	0	
7	Moderna	4 days	Mild	Yes	6 days	0	0	0	0	1	1	0	
8	Pfizer	4 days	Mild	Yes	22 days	1	0	0	0	1	1	0	
9	Pfizer	7 days	Mild	Yes	7 days	0	0	0	1	0	0	0	
Flare After Vaccine Dose #2													
5	Moderna	1 day	Severe	No	8 days	0	1	1	0	1	1	0	
6	Moderna	1 day	Mild	Yes	4 days	1	0	0	0	1	0	0	
10	Moderna	1 day	Moderate	Yes	3 days	0	1	1	0	1	1	0	
11	Pfizer	3 days	Moderate	Yes	8 days	0	1	1	0	1	1	1	Increased neuropathy, neck pain, knee pain
12	Pfizer	7 days	Moderate	Yes	2 days	0	1	0	1	1	1	0	

*12 patients reported 14 flares (2 patients flared at 2/2 vaccine doses).