Title: Analyzing inpatient vaccine reactions amongst systemic lupus erythematosus patients in the COVID-19 era: a national analysis

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Character Count: 2,289/2300

Introduction: Patients with systemic lupus erythematosus (SLE) are prone to severe infection given the aberrant immune responses inherent to their disease and immunosuppressive medications used to manage their disease.[1] During the coronavirus of 2019 (COVID-19) and subsequent vaccine rollout, SLE patient hospitalizations including those due to COVID-19 vaccine reactions were areas of concern. While the VACOLUP trial of 700 SLE patients showed disease flares in 3% of patients after COVID-19 vaccine,[2] subsequent studies reported flares in one third of patients after vaccine.[3] We aimed to characterize hospitalization trends on a national scale amongst SLE patients following COVID-19 vaccine rollout.

Methods: The 2016-2020 Nationwide Inpatient Sample was queried for SLE hospitalizations using International Classification of Diseases, Tenth Revision (ICD-10) code "M32". SLE hospitalizations with co-morbid vaccine reactions (RX+) were identified using ICD-10 codes "T50.x". Chi-square and t-tests were used to compare clinical and demographic features and rates of high-risk underlying medical conditions, as defined by the CDC, between RX+ and RX- SLE inpatients.

Results: Among 1,082,960 total SLE hospitalizations between 2016-2020, 15,625 (1.4%) were RX+. RX+ patient hospitalizations increased from 1.2-1.3% in 2016-2018 to 1.6% in 2019 and 2020 ($p<0.001$). RX+ patients were on average 3 years older (55.0 vs. 52.1 years, $p<0.0001$), with a higher proportion of males (12.4% vs. 11.7%, $p=0.01$). RX+ patients were more likely to identify as Black (31.6% vs. 30.9%, $p=0.02$), be in the highest income quartile (19.7% vs. 17.6%, $p<0.0001$), and use either Medicare (54.0% vs. 49.0%) or self-pay insurance (3.6% vs 3.0%) ($p<0.0001$). RX+ patients had a 5% greater proportion of non-routine discharges, with higher proportions transferred to other facilities (40.5% vs. 35.3%, $p<0.0001$). SLE RX+ patients exhibited significantly different rates of high-risk underlying medical conditions. RX+ patients had a greater burden of heart disease (48.5% vs. 34.1%, $p<0.0001$) and chronic kidney disease (36.3% vs. 29.7%, $p<0.0001$). RX+ patients were more likely to be elderly, have chronic liver or lung disease, HIV, and obesity ($p<0.01$).

Conclusion: Increases in vaccine-related SLE hospitalizations were observed during the COVID-19 pandemic. Hospitalized SLE patients with vaccine reactions had a higher proportion of co-morbidities, most notably heart and kidney disease. Limitations included possible error in coding of vaccine reaction by recording physician, lack of data regarding specific vaccine formulation triggering reaction, and medication information.

References

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