

Hospital Outcome of COVID-19 among Systemic Lupus Erythematosus Patients on Immunosuppressant Medications

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Background

- Bangladesh is among the top 30 countries and accounts for 0.69% of the COVID-19 cases of the world
- During COVID-19 pandemic, individuals with systemic lupus erythematosus have been of particular concern
- SLE patients are more or less heavily immunosuppressed due to immunosuppressive medications
- Concomitant presence of both diseases may worsen COVID-19

Rationale

- Demographic factors as well as comorbidities have been associated with poorer COVID-19 outcomes in the general population
- The COVID-19 Global Rheumatology Alliance has reported glucocorticoid dose (≥ 10 mg/day), some immunosuppressive drugs and disease activity as predictors of poor COVID-19 outcomes in individuals with different rheumatic diseases
- Therefore, we conducted this study to find out clinical, biochemical and hospital outcome of SLE patients on immunosuppressive drugs who had COVID-19

Methods

- Study Design- Prospective
- Study Place- COVID Unit, Dhaka Medical College Hospital
- Study Duration – May 2020 to April 2021
- Inclusion Criteria

- All diagnosed case of SLE on immunosuppressive medications (Hydroxychloroquine, Prednisolone, Azathioprine, Mycophenolate mofetil) with confirmed COVID-19.

For case definitions and clinical severity assessment National Guideline of Bangladesh for COVID-19 were followed.

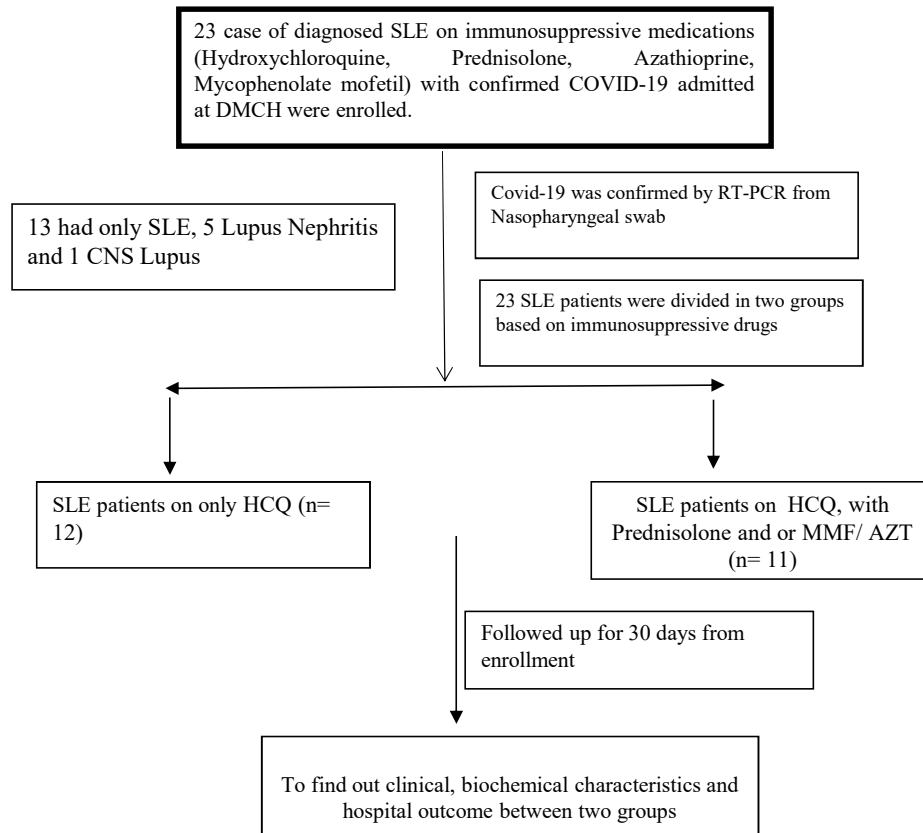


Figure: Flow Chart of Research Work

Statistical Analysis

- To compare base line characteristics – chi square test (qualitative) and independent sample T (quantitative) test were performed.
- To find out survival benefit in relation to immunosuppressive medications cox regression along with Kaplan- Meire Curve analysis were performed
- To compare duration of COVID illness with SLE disease activity One way ANOVA analysis was done

Result

Table 1. Comparison between Socio-demographic and clinical characteristics of 23 SLE patients with COVID-19 between HCQ only and HCQ, Prednisolone, AZT/MMF group

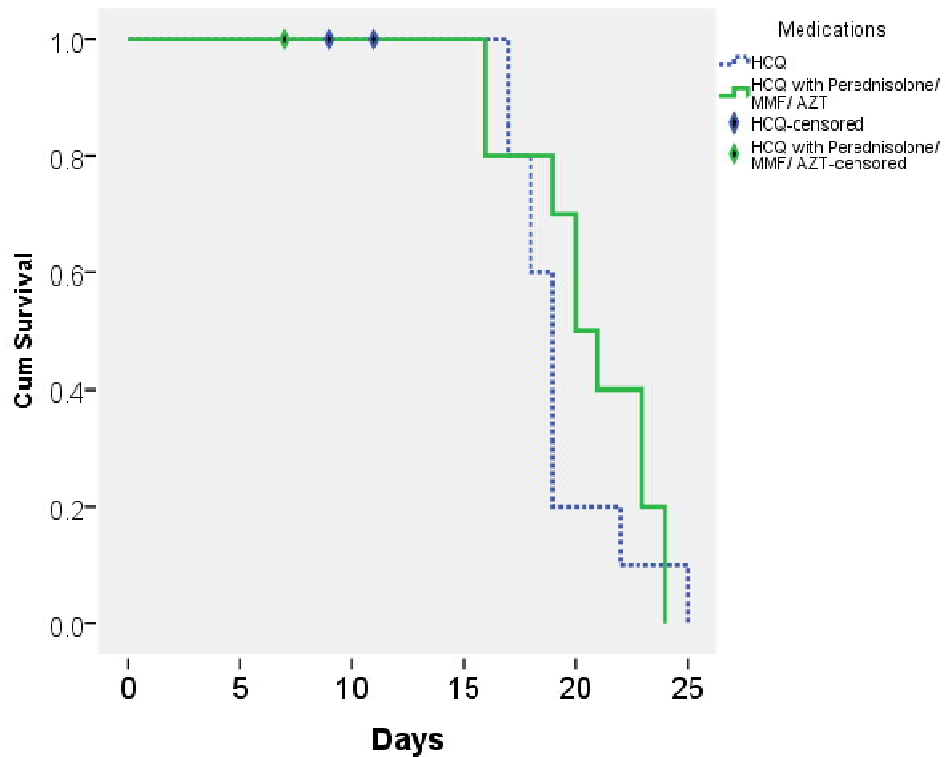
Trait	Hydroxychloroquine only (n=12) frequency (%)	Hydroxychloroquine, and or MMF/ AZT and Prednisolone (n=11) Frequency (%)	P value < 0.05 significant
Age (Mean ± SD)	34 ± 9	33 ± 7	0.65
Sex			
Female	12	11	
Contact with Covid patient	7 (58.3)	6 (54.5)	0.81
Co-morbidities			
HTN	4 (33.3)	3 (27.2)	0.44
DM	1 (9.1)	3 (27.2)	0.07
Asthma	2 (16.7)	2 (18.1)	0.62
Pregnancy	1 (9.1)	0	1.2
CKD	1 (9.1)	1 (9.1)	0.98
Clinical Characteristics			
Duration of symptoms	17 ± 4	19 ± 5	0.31
Duration of Hospital stay	13 ± 3	15 ± 3	0.19
Symptoms & Sign			
Fever	12 (100)	9 (81.8)	
Cough	9 (75)	8 (72.7)	
Sore Throat	10 (83.3)	8 (72.7)	
Shortness of breath	10 (83.3)	7 (63.6)	
Myalgia	8 (66.7)	8 (72.7)	
Anosmia	6 (50)	5 (45.4)	
Hypoxia	9 (75)	5 (45.4)	
Hypotension	4 (33.3)	1 (8.3)	
Convulsion	1 (8.3)	0	
Oral Ulceration	1(8.3)	1(9.1)	
Joint pain	1(8.3)	1(9.1)	
Alopecia	1(8.3)	0	
Headaches	1(8.3)	1 (9.1)	
SpO₂ on air during admission	92 ± 4	90 ± 4	0.15
SLE DAI on admission	8 ± 3	7 ± 4	0.43
Severity of COVID-19			
Mild	3 (25)	3 (50)	0.88
Moderate	4 (33.3)	4 (27.2)	0.27
Severe	5 (50)	4 (18.1)	0.12

Laboratory Characteristics

Laboratory Characteristics	Hydroxychloroquine only (n=12)	Hydroxychloroquine, MMF/ AZT and Prednisolone (n=11)
Neutrophil count, [K/ μ L, SD]	6.7 [2.9]	8.3 [3.7]
Lymphocyte Count, [K/ μ L, SD]	0.87 [0.38]	1.2 [0.25]
Platelet Count, [K/ μ L, SD]	218 [0.93]	221 [69]
CRP (N= 0-10 ng/ml)	57 [min 13, max 132]	49 [min 14, max 97]
ESR (N= 10- 20 mm/h)	59 [min 22, max 113]	43[min 22, max 87]
Proteinuria (N %)	1 (8.3)	2 (18.1)
Ferritin (N= 10-120 ng/ml)	392 [min 153, max 2151]	289 [min 77, max 796]
D-dimer (N= < 0.5ng/ml) , Median	1.32 [min 0.2, max 10]	1.10 [min 0.3, max 3.7]
APTT (N= 30-40 sec)	45.5 [8.34]	41.5 [8.14]
C3 (N= 0.9-1.8 g/ L)	0.75[0.21]	0.81[0.17]
C4 (N= 0.2-0.5 g/L)	0.10 [0.05]	0.9 [0.04]
RT-PCR for COVID-19 positive	12 (100%)	11 (100%)
HRCT Chest		
Bilateral GGO	5 (41.6)	6 (54.5)
Unilateral GGO	2 (16.7)	1 (9.1)

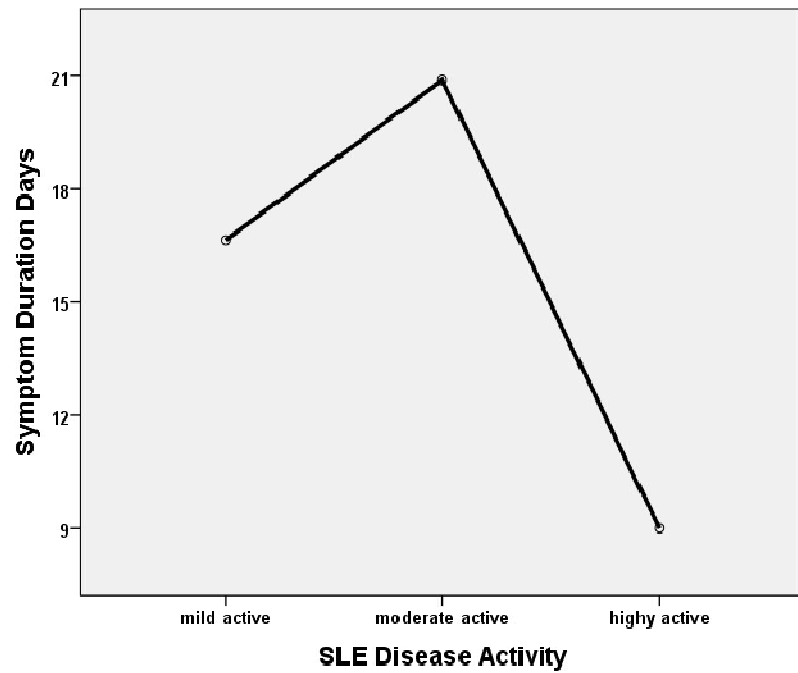
Hospital Outcome

Outcomes	Hydroxychloroquine only (n=12) (%)	Hydroxychloroquine, MMF, AZT and Prednisolone (n=11) (%)	P value < 0.05 significant
Duration of Hospital stay	13 ± 3	15 ± 3	0.19
Severe Covid	5 (45.5)	4 (36.3)	0.38
Hypoxia†	7 (58.3)	5 (45.4)	0.09
Improved & discharge	10 (83.3)	9 (81.1)	0.14
ICU admission † Mechanical Ventilation	2 (16.6) 2	1 (9) 1	0.09
Death	2 (16.7)	1 (9)	0.11



Medication Group	Median Estimate	95% CI	P value <0.05 (significant) (Log rank-Mantle Cox)
HCQ	19.30	18.3 - 19.6	0.38
HCQ+ Prednisolone+ AZT/ MMF	20.64	17.9 - 22.1	0.22
Overall	19.00	18.1 - 19.9	0.25

Kaplan-Meire Survival Analysis between HCQ and HCQ with Prednisolone and or AZT/MMF treatment group outcome



SLE Disease Activity	Mean Estimate	95% CI	P value <0.05 (significant) (One way ANOVA Test)
Mild	19.2	17.5 - 20.8	0.001
Moderate	20.8	19.1 - 22.7	0.001
High	9.0	5.9 - 12.1	0.001

Mean Plot showing the relation of duration of Covid illness with severity index of SLE

Highly active SLE patients died with a mean duration 9 (± 2) day

Interpretation

- Clinical, laboratory characteristics between HCQ and HCQ with Prednisolone and or AZT/MMF treatment group did not have any significant difference
- Severity of COVID-19 was moderate to severe in both groups
- No significant difference regarding duration of illness, hospital stay and mortality
- Significant relationship present between disease activity of SLE with duration of COVID illness

Strength

- Prospective Cohort

Limitations

- Very small size
- No randomization

Conclusion

- Overall, Covid-19 has moderate to severe disease severity among active SLE patients.
- SLE patients on immunosuppressive medications suffered long duration of COVID symptoms, hospital stay and more severe COVID-19
- SLE with high disease activity was associated with poor outcome
- A multidisciplinary team approach should be followed to manage this special group of patients

Acknowledgement

- We are really grateful to our patients who gave us informed consent for research work
- Special thanks to all the nurses and hospital staff who helped us throughout 1 year.



THANK YOU