SHORT COMMUNICATION

# COVID-19 infection in patients with autoimmune rheumatic diseases: Patient's perspective and descriptive analysis from a lower-middle-income country

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## Abstract

The study was conducted to determine the severity of COVID-19 in autoimmune inflammatory rheumatic disease (AIRDs) patients and knowing their perceptions. All AIRDs cases with COVID-19 infection between December 2020 and February 2021 were included. A cross-sectional telephonic survey was conducted for perceptions. Twenty-one patients were analysed for severity of illness and 16(76.2%) for perceptions. Mean age was 44.8±14.8 years, with 11(52.4%) females. Two (9.5%) patients had severe disease, 6(28.6%) required hospitalisation, and none expired. Hypertension 7(33.3%) was the commonest comorbidity. Low dose steroids were the most used drug 9 (42.9%). Regarding perceptions, 10 out of 16 (62.5%) felt that AIRD made them vulnerable to COVID-19 infection. The most common reason of delay in seeking medical advice from the rheumatologist was closure of services for chronic diseases during the pandemic. Patients with AIRDs, receiving immunosuppressive treatment seem to be at a lower risk of developing a severe form of COVID-19 pneumonia.

**Keywords:** COVID-19, Rheumatic diseases, Autoimmune diseases, Immunosuppressive agents.

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## Introduction

The COVID-19 pandemic has resulted in more than 500 million infections and six million deaths.[1] During the early phase of the pandemic it was noted that patients with autoimmune inflammatory rheumatic diseases (AIRDs) had a higher preponderance for COVID-19 with worsening outcomes.[2] This may be due to an increased simultaneous presence of chronic diseases and use of various immunosuppressants. Global Rheumatology Alliance, a registry maintained by physicians, reported around 600 cases of rheumatologic diseases and COVID-19. Nearly half of these required hospitalisation and 9% had fatal outcome.[3] People with AIRDs logically argued with their care providers about the risk of developing a severe infection and inquired about the beneficial effects of reducing or stopping immunosuppressive drugs. Data regarding COVID-19 infection in patients with AIRDs is lacking from lower middle-income countries (LMICs). This study was conducted to examine the severity of SARS-CoV-2 infection in patients receiving immunosuppressive therapy for AIRDs from a single centre of Karachi, and their perception as to how COVID-19 affected their rheumatic disease and access to care.

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## Patients/Methods and Results

A combined retrospective observational study and cross-sectional telephonic survey was conducted at the Aga Khan University Hospital (AKUH), Karachi, Pakistan. The study was granted approval by the Ethical Review Committee of AKUH (ERC Number: 2020-5530-15347). All adult patients with AIRDs and COVID-19 attending the rheumatology clinic between December 1, 2020, and February 28, 2021, were recruited. Information regarding socio-demographics, risk factors for COVID-19, history of potential exposure to a patient suffering from COVID-19, symptoms and severity of infection, need for hospitalisation, medication history, and outcome of COVID-19 illness were recorded. The severity of illness was categorised according to the National guidelines into asymptomatic, non-severe, severe, and critical disease.[4] Hospitalisations, ICU admissions, and death were measured as outcomes.

Furthermore, a cross-sectional telephonic survey was performed to evaluate patients' perception regarding the impact of COVID-19 illness on AIRD, patient's global assessment of the underlying AIRDs activity and the quality of care provided during the pandemic. A standardised questionnaire was used with patients who consented to participate. IBM Statistical Package for Social Sciences (SPSS) version 22.0 was used for data analysis. Qualitative variables, like gender, comorbidities, rheumatic diseases, treatment history, and perceptions were reported as frequency and percentages.

A total of 21 patients reported to have SARS-CoV-2 infection. There were 11 (52.4%) women with mean age of 44.8±14.8 years. Eight (38.1%) patients had a history of

**Table-1:** Demographics and disease characteristic of patients with rheumatic diseases and diagnosed with COVID-19 (n=21).

| | | n (%) |
|---|---|---|
| **Gender** | | |
| | Female | 11 (52.4) |
| | Male | 10 (47.6) |
| **Mean Age** (years) | | 44.8±14.8 |
| **Primary Rheumatic Disease** | | |
| | Systemic Lupus Erythematous | 1 (4.8) |
| | Rheumatoid Arthritis | 3 (14.3) |
| | Seronegative spondyloarthropathy | 7 (33.3) |
| | Mixed Connective Tissue Disease | 2 (9.5) |
| | Dermatomyositis/ polymyositis | 1 (4.8) |
| | Vasculitis | 3 (14.3) |
| | Sjogren syndrome | 1 (4.8) |
| | Juvenile Idiopathic Arthritis | 1 (4.8) |
| | Adult still disease | 1 (4.8) |
| | Sarcoidosis | 1 (4.8) |
| **Comorbid Condition** | | |
| | Hypertension | 7 (38.9) |
| | Cardiovascular disease | 3 (16.7) |
| | Diabetes | 1 (5.6) |
| | Lung disease | 2 (11.1) |
| **Medications before COVID-19 infection** | | |
| | Non-Steroidal Anti-inflammatory Drugs | 2 (5.4) |
| | Steroids | 9 (24.3) |
| | Hydroxychloroquine | 6 (16.2) |
| | Methotrexate | 7 (18.9) |
| | Leflunomide | 2 (5.4) |
| | Sulphasalazine | 4 (10.8) |
| | Non Interluekin-6 inhibitor | 3 (8.1) |
| | Mycophenolate Mofetil | 1 (2.7) |
| | Azathioprine | 3 (8.1) |

contact with a COVID-19 positive family member. Hypertension was the commonest comorbidity 7 (38.9%), followed by cardiovascular disease 3 (16.7%) and diabetes mellitus 1 (5.6%). Seventeen (80.9 %) had a positive nasopharyngeal RT-PCR test, two (9.5 %) had CT scan of the chest (HRCT) which was highly suggestive of COVID-19 infection, while the remaining two (9.5%) had serological diagnosis, i.e. positive IgG antibody test. Sixteen (76.2%) of these patients participated in the telephonic survey, while the remaining 5 (23.8%) could not be reached out. Nine (24.3%) patients were on low dose steroids (≤ 5mg/d) at the time of contracting SARS-CoV-2 infection. Demographic characteristics, autoimmune rheumatic disease diagnosis, comorbid conditions, history of exposure to a patient infected with SARS-CoV-2, and treatment history are summarised in Table 1. The common presenting symptoms were cough 15 (71.4%), fever 12 (57.1%), and shortness of breath 7 (33.3%). Nineteen (90.5%) patients had non-severe COVID infection, while 2 (9.5%) developed severe disease and required non-invasive ventilation for respiratory distress. Six (28.6%) patients required hospitalisation due to hypoxia requiring supplemental oxygenation. The mean length of hospital stay for hospitalised patients was 5.3±3.3 days. No fatal outcome was observed. Treatment provided during infection with COVID-19 has been summarised in Table 2.

**Table-2:** Treatment for COVID-19.

| | n (%) |
|---|---|
| Antiviral | 2 (8) |
| Hydroxychloroquine/ Chloroquine | 2 (8) |
| Steroids | 8 (32) |
| Azithromycin | 3 (12) |
| Anticoagulation | 1 (4) |
| Supplemental Oxygen | 2 (8) |
| Proning | 3 (12) |
| Non-invasive ventilation | 2 (8) |

Of the 16 (76.2%) patients who participated in the telephonic survey, 10 (62.5%) consulted their rheumatologist and asked if they should continue or stop immunosuppressive treatment, 2 (12.5%) stopped DMARDs thinking that continuing such treatment might be harmful during the pandemic. The most common reason cited for delay in seeking health care was suspension of services to patients with chronic diseases by most hospitals. Twelve (75.0%) believed having an AIRD made them more susceptible for SARS-CoV-2 infection, while 9 (56.3%) felt that immunosuppressive treatment was an added risk for COVID-19 infection. Methotrexate was the commonest DMARD to be put on hold by the rheumatologist during COVID-19 course of illness. To assess the activity of the underlying AIRDs during COVID-19 infection, participants were asked to rate how good or bad their AIRD was over the last one week on a visual analogue scale of 0–100, wherein 0 being the best and 100 the worst. Nine (56.3%) patients rated their disease control as mildly active (0-30), 3 (18.8%) moderately active (31-60), and 4 (25.0%) as severely active disease (61-100). All patients who participated in the telephonic survey expressed full satisfaction with the care that had been provided by the treating rheumatologist(s) during the COVID-19 illness as well as soon after recovery. They felt that all inquiries about COVID-19 were answered to their level of satisfaction and clear instructions were given to stop Methotrexate where indicated. When they were asked about the most essential measure that would have helped them in coping with COVID-19 during the pandemic and treatment with immunosuppressive drugs for AIRD, "regular follow up whether physically or through Tele-health with the treating rheumatologist" was the most common response.

## Conclusion

Literature does not show any evidence that patients with AIRDs have a higher risk of acquiring COVID-19 infection, nor does it report poorer outcomes as compared to general population.[5] The effect of the COVID-19 pandemic on individuals with AIRDs remains unclear. Factors like age >65 years, male gender, and prior comorbidities have been known to cause severe and critical COVID-19 in general population.[6] Likewise, people on immunosuppressive treatment, including those with systemic rheumatic diseases, are at increased risk of infection, including SARS-CoV-2.[7] This study attempted to explore the influence of COVID-19 pandemic on the lives of people with AIRDs living in a LMIC. The results showed that most patients perceived themselves more vulnerable to SARS-CoV-2 infection in comparison to general population. The proportion of individuals who attributed this to underlying immune disease was higher than those who thought immunosuppressive treatment might be a risk factor. Consequently, most of them were taking preventative measures such as social distancing and use of face masks. Only two patients suspended immunosuppressive therapy abruptly due to the worry of having more severe COVID-19 infection. Nearly 2/3 patients discussed this query with their treating rheumatologist and continued with treatment except Methotrexate. Therefore, a close follow up of this special population by the rheumatologist using innovative measures like telehealth, for monitoring of immunosuppressive therapy and continued education, is of paramount importance. Establishing Tele-health clinics may prove to be a useful strategy in this regard.[8]

Due to the small sample size of the study population, the risk factors for infection or the impact of DMARDs on the risk of SARS-CoV-2 infection could not be analysed. Different results have been reported in studies from across the globe in patients of systemic rheumatic diseases taking immunosuppressive treatments and suffering from COVID-19.[9,10] In a nationwide cohort study from South Korea, the odds of testing positive for SARS-CoV-2, developing severe COVID-19, and COVID-19-related death were not associated with treatment with any dose of systemic corticosteroids or DMARDs, except in the case of patients receiving 10mg or more of systemic corticosteroids.[10]

Though this study is limited due to it being a single-centre study with a small sample size and retrospective study design, we believe it will be beneficial for patients to continue taking their rheumatological treatment regimens to prevent worsening of disease symptoms. Health care systems need to establish well organised tele-health services along with physical consultation to improve access to care for patients with AIRDs in unprecedented situation of COVID-19 pandemic. Further multi-centre studies are needed to confirm the results and help patients with rheumatic diseases during the pandemic.

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