SHORT TERM CLINICAL COURSE OF COVID-19 IN PATIENTS WITH IMMUNE MEDIATED INFLAMMATORY RHEUMATIC DISEASES

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ABSTRACT

Objective: To assess short term clinical course of COVID-19 in patients with immune mediated inflammatory rheumatic diseases managed at Pak Emirates Military Hospital Rawalpindi.
Study Design: Correlational study.
Place and Duration of Study: Pak Emirates Military Hospital Rawalpindi, from Mar 2020 to May 2020.
Methodology: Patients who were diagnosed with COVID-19 on polymerase chain reaction having previously an immune mediated inflammatory rheumatic condition diagnosed by consultant medical specialist or rheumatologist were included in the study. They were followed up for three weeks after the positive polymerase chain reaction. Patients who became negative without any serious complications considered as having good prognosis while those who were shifted to intensive care unit or died were considered as having the poor prognosis.
Results: A total of 87 patients with any of the immune mediated inflammatory rheumatic condition tested positive for COVID-19 on polymerase chain reaction were included in the final analysis. 77 (88.5%) had uneventful recovery without any complications either at home or in routine wards while 8 (9.1%) needed oxygen and intensive care unit support while 2 (2.3%) died within three weeks of diagnosis of being positive for COVID-19. Increased age and long duration of illness were the factors significantly related to poor prognosis in our study.
Conclusion: Short term course among patients with any of the immune mediated inflammatory rheumatic condition tested positive for COVID-19 on polymerase chain reaction was not found much different from the general population getting positive for COVID-19. Elderly patients and patients with long standing underlying immune mediated inflammatory rheumatic condition may be at more risk for getting the complications.

Keywords: COVID 19, Immunological, Prognosis, Rheumatology.

INTRODUCTION

Pandemics have not been new for the mankind and in past there have been multiple pandemic hitting the human race causing high mortality and morbidity[1]. COVID-19 is the pandemic of 21st century already taken thousands of lives all around the world in few months of time and challenging the health systems of even the most developed countries[2]. Clinician and researchers all around the world have been trying their level best to look for all the aspects of COVID-19 and response of patients who have other illnesses.

Health systems all around the world have been trying their level best to absorb the shock COVID-19 is putting[3]. Clinicians have not been doing routine outpatient clinics in most parts of the world but on the other hand main chunk of patients which could have complications may be the patients who have already been suffering from chronic physical health conditions[4,5]. Though most patients developing complications have comorbid medical conditions[5] but patients with immune based disorders may be on some advantage as immune modulators may have a role in fighting against this novel virus[6].

Limited work has been done to cover all the relevant aspects of COVID-19 due to time constraints as this pandemic has just been hitting the patients for last six months. Clinicians have been working day and night for managing the COVID-19 patients so research coming up with a

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slow pace. Monti *et al* published a paper in BMJ with objective to look for the course of COVID-19 among patients with long term RA managed with immune modulators. They concluded that patients receiving immunomodulation therapy and well controlled RA may be at high risk for acquiring the infection, but complication rate was not more than the general population[7]. Marotto *et al* published an interesting article in this regard highlighting the role of rheumatologist in COVID-19 pandemic. They floated the idea that patients with immune based inflammatory rheumatic conditions are at a high risk and suggested alternative management methods such as delaying routines and medical appointments, promoting teleworking, and developing apps to monitor their condition[8]. Haberman *et al* recently published a case series from USA in new England journal of medicine about the course of COVID-19 patients having any immune mediated inflammatory disorder and managed with immune modulator drugs. Out of 86 patients only 14 patients required hospitalization, one patient required the ICU level monitoring or care and one patient died. Twelve out of 14 in hospital were managed in the routine wards without any oxygen while 7 required oxygen during the course of illness to maintain the oxygen saturation[9].

We are still in a process to make any local guidelines regarding management of patients with or without complications of COVID-19. Patients have been managed symptomatically according to their symptoms. Patients with special needs like having any chronic illness or disability may require special consideration regarding management. Song *et al* published a case report in this regard highlighting management of pneumonia in patients of RA due to COVID-19 but there is lack of data in this regard. We therefore planned this study with the rationale to assess short term course of COVID-19 in patients with immune mediated inflammatory conditions managed at Pak Emirates Military Hospital Rawalpindi.

METHODOLOGY

This correlational study was planned and conducted at Pak Emirates Military Hospital Rawalpindi between March 2020 and May 2020. Sample size was calculated by using the WHO sample size calculation by using the population prevalence proportion of complication among patients of COVID-19 as 3%[11]. Non probability consecutive sampling was used to gather the sample. All the COVID-19 PCR positive patients between age of 18 and 70 years diagnosed with any immune mediated inflammatory rheumatic diseases by consultant rheumatologist and managed with immune modulating drugs according to the guidelines set by American College of Rheumatology were included in the study[12]. Patients with any comorbid systemic illness other than immune mediated inflammatory rheumatic diseases were made part of the exclusion criteria. Pregnant females were also not included in the study. Patients having any kind of solid or hematological malignancy were also excluded from the study. Patients whose follow up was not possible for three weeks were also the part of exclusion criteria.

Ethical approval was taken from the ethical committee of hospital via letter no A/124/87/EC120. Patients suspected for COVID-19 which turned out to be positive on PCR test[13] having diagnosis of any immune mediated inflammatory rheumatic diseases were included in the study after application of inclusion/exclusion criteria. They were followed up for three weeks for the clinical course. Patients who had uneventful recovery at home or in routine clinical wards and became PCR negative in these three weeks were categorized as patients with good clinical course. Patients who had presence of complications and required oxygen therapy or organ support or shifted to intensive care unit or died during these three weeks due to complications of COVID-19 were categorized as having poor clinical course. Sociodemographic factors like age, gender, polypharmacy and duration of underlying immune mediated rheumatological condition were

corelated with poor clinical course among the study participants.

Statistical analysis was done by SPSS 24.0. Frequency and percentage were calculated for the qualitative variables whereas mean and standard deviation was calculated for the quantitative variables. Chi-square test was used to look for the relationship of age, gender, polypharmacy and duration of underlying immune mediated rheumatological condition with presence of poor clinical course among the target population. The *p*-value less than or equal to 0.05 was considered significant.

RESULTS

Around 100 patients with various immune based inflammatory conditions were found COVID-19 positive on PCR and approached for the study but after application of inclusion/ exclusion criteria 87 were finally recruited in the study and followed up for three weeks. Out of these 87 patients, 32 (36.8%) were male while 55 (63.2%) were female. Table-I shows the demographic characteristics of patients. Most common immune based condition among patients included in the study was rheumatoid arthritis 40 (45.9%) followed by psoriatic arthritis 19 (21.8%). 77 (88.5%) patients from the study participants had uneventful recovery without any complications either at home or in regular hospital ward while 8 (9.1%) needed oxygen and ICU support while 2 (2.3%) died within three weeks of diagnosis of being positive for COVID-19. Table-II shows that after applying the chi-square analysis increased age and long duration of illness were the factors significantly related to poor prognosis in our study (*p*-value<0.05) while polypharmacy and gender had no such association (*p*-value 0.632 and 0.453 respectively).

DISCUSSION

Number of COVID-19 cases have been alarmingly increasing in our population in last two months[14,15]. Hospitals, ICUs, quarantine and isolation centers have been getting to full and doctors from all the specialities either directly or indirectly getting affected by this pandemic[15]. Rheumatology has always been a busy speciality with patients using medications which need regular monitoring as well. There has been a lot of debate that patients with immunocompromised status and having chronic immune mediated disorder are at a high risk of getting complications with COVID-19[4,5]. On the other hand, immunomodulators commonly used in rheumatology have been tested for managing the immune storm related to COVID-19[6]. We therefore found it interesting and really important to conduct a study in order to assess short term clinical course

Table-I: Characteristics of study participants (n=87).

Age (years)	
Mean ± SD	47.26 ± 2.145 years
Range (min-max)	19-66 years
Gender	
Male	32 (36.8%)
Female	55 (63.2%)
Underlying Immune Based Condition	
Rheumatoid arthritis	40 (45.9%)
Psoriatic arthritis	19 (21.8%)
Psoriasis	12 (13.8%)
Ankylosing spondylitis	11 (12.6%)
Others	5 (5.7%)
Course of COVID-19	
Uneventful recovery	77 (88.5%)
Shifted to intensive care unit	08 (9.2%)
Death	02 (2.2%)

Table-II: Outcome of various variables studied in the analysis.

Factors Studied	Good Clinical Course	Poor Clinical Course	*p*-value
Age			
18-50 years	68 (88.3%)	06 (60%)	0.036
>50 years	09 (11.7%)	04 (40%)	
Duration of Immune Based Disease			
<5 years	62 80.5%)	04 (40%)	0.009
>5 years	15 (19.5%)	06 (60%)	
Gender			
Male	29 (37.6%)	03 (30%)	0.632
Female	48 (62.4%)	07 (70%)	
Polypharmacy			
No	53 (68.8%)	08 (80%)	0.453
Yes	24 (31.2%)	02 (20%)	

of COVID-19 in patients with immune mediated inflammatory rheumatic diseases managed at Pak Emirates Military hospital Rawalpindi.

Song *et al* published an interesting case report in which the patient with RA developed pneumonic symptoms due to COVID-19. All the Disease modifying drugs except hydroxychloroquine were stopped and he was given antiviral treatment as well. Patient recovered in three weeks' time[16]. This highlights that complications may develop in RA patients but recovery was due to stopping the DMARDs, continuing the hydroxychloroquine or using the antivirals, it cant be deduced from a single case. We did not stop the immunomodulators, patients were taking and offered antibiotics to only those who were admitted in ICU with positive findings on chest x-ray.

Askanase *et al* published an interesting paper in this regard summarizing that data from China suggest that using immunomodulatory therapies like chloroquine, tocilizumab (preferred right now because of the track record) and baricitinib can quench the cytokine storm that ensues in patients with very severe COVID-19 pneumonia. Patients admitted for severe COVID-19 infections should probably hold maintenance therapies; these decisions are best left to the rheumatology/infectious disease teams taking care of them. Rheumatologists and infectious disease specialists should be working together in this epidemic as clear data are not available, thus making recommendations speculative[17]. As very less is known about course and management for this novel virus therefore multidisciplinary approach may be adopted and decisions should be made according to presentation in each case.

Favalli *et al* came up with a very practical approach and highlighted that patients with RA carry a higher infectious risk than the general population. The use of synthetic and biologic disease-modifying drugs is associated with a potential further increase in the incidence of serious infections, but the poor control of RA disease activity is an even greater infectious risk factor. Thus, RA patients should be encouraged to continue their treatment even during COVID-19 outbreak[18]. We used the same approach and most of our patients had good recovery and favorable short clinical course.

Haberman *et al* studied 86 patients of immune mediated disorders with COVID-19. 14 out them were admitted to the hospital. Of these 14, 79% (11 of 14) were discharged (mean stay, 5.6days), and 2 remain hospitalized as of April 3. Of the 2 patients with more severe disease, 1 had elevated interleukin-6 levels and received mechanical ventilation for acute respiratory distress syndrome, and the other died in the emergency department; neither patient was receiving biologic therapies on a long-term basis[9]. Our results were quite similar and out of 87 patients we studied, 77 (88.5%) had uneventful recovery without any complications either at home or in routine wards while 8 (9.1%) needed oxygen and ICU support while 2 (2.3%) died within three weeks of diagnosis of being positive for covid-19.

The main limitation of this short term study was that outcomes was recorded and patients in ICU were not followed up after three weeks to ascertain their final outcome. Moreover, severity and control of underlying immune mediated rheumatological condition was not recorded and compared in both the groups of patients. Patients using nutritional supplements, multivitamins or complimentary therapies were not excluded from the study. Studies on a larger scale addressing these limitations may generate better results regarding impact of COVID-19 among the patients with immune mediated rheumatological diseases.

CONCLUSION

Short term course among patients with any of the immune based inflammatory condition tested positive for COVID-19 on PCR was not found much different from the general population getting positive for COVID-19. Elderly patients and patients with long standing underlying immune based inflammatory condition may be at more risk for getting the complications.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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