Epidemiology and clinical characteristics of COVID-19 in rheumatic diseases at a tertiary care hospital in Wuhan, China

Sirs,

Since the first report of 2019 novel coronavirus disease (COVID-19) in December 2019, the outbreak quickly became a global health emergency. Rheumatic disease (RD) patients are well known to be at higher risk of infection attributed to disease-associated immune dysregulation, accompanying comorbidities, and use of immunosuppressive agents (1, 2). Because of anti-inflammation effects, some disease-modifying anti-rheumatic drugs (DMARDs) have been recommended as potential treatment candidates for the management of COVID-19 (3, 4), which seems to suggest that RD patients might further benefit from such medication. In this context, the incidence rate of COVID-19 in RD patients is unclear. This study aimed to investigate the epidemiology and clinical characteristics of COVID-19 in RD.

This was a single-centre, retrospective study approved by the Institutional Ethics Board of Zhongnan Hospital of Wuhan University (ref.: 2020042K). Verbal consent was obtained from the living patients or from the relatives of those deceased. Outpatients and inpatients in our hospital from July 15, 2018 to January 22, 2020 were enrolled. COVID-19 pneumonia was diagnosed based on the updated COVID-19 Diagnostic Criteria, 5th Edition (5). Data detailing demographic information, types of rheumatic diseases, current treatment drugs, comorbidities, occupation, exposure history and state of COVID-19 were collected through telephone surveys, which finished on March 24, 2020. Eight out of the 627 patients investigated were diagnosed as having COVID-19 infection, 6 patients lived in Wuhan, and 2 in other cities of Hubei Province. The infection rate was 1.28% (8 of 627 patients, 95% CI, 0.4–2.2%). This was higher than the cumulative incidence of all diagnosed COVID-19 cases reported in the Hubei province over the same period (0.12%; 67,801 of 57,237,727 cases; data cut-off on March 24, 2020). The odds ratio of COVID-19 infection in RD compared to the community population was 10.898 (95% CI, 5.425–21.889, $p<0.001$).

The characteristics of the 8 patients diagnosed as COVID-19 are summarised in Table I. The median age of the infected patients was 54.5 years (range: 32–78 years). All infected patients had comorbidities. Half of the patients were in the active phase of rheumatic diseases. Half of them received anti-rheumatic treatments. All patients had fever, while three (37.5%) had dyspnea and cough. Median time of hospitalisation was 11 days (range: 5–21 days). Three patients (37.5%) who were classified as severe cases and died, were older (median age 65 years) and had multiple comorbidities. Moreover, they had higher disease activity.

The incidence rate of COVID-19 infection in RD patients was 1.28%, which is close to the data reported by Monti and colleagues (1.25%) (6), but higher than that reported by Favalli *et al*. (0.57%) (7). The reasons for this different incidence might be due to population and/or regional differences. The incidence of COVID-19 in RD patients was significantly higher than the community population in our study. We think the reasons might be rheumatic disease itself, immunosuppressive treatments, comorbidities and increased hospital visits during the course of the epidemic period. In our study, 3 of the 8 patients with COVID-19 infection died: this mortality rate was higher than in the general population (4.7%, 3,163/67,801 cases; data cut-off on March 24, 2020). Because the patients who died were older and had multiple chronic comorbidities, were in the active rheumatic disease phase, and the intervals from the initial symptoms to diagnosis was longer than in survival patients, this suggests that active RD diseases, older age and comorbidities might contribute to more infection and fatal results. Therefore, we propose that RD patients should be closely monitored and controlled.

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Table I. Characteristics of rheumatic disease patients with COVID-19 infection.

Patient no.		1	2	3	4	5	6	7	8
Age (y)		62	44	48	65	57	78	32	52
Sex		F	F	F	M	F	M	M	F
Rheumatic disease		SLE	PR	pSS	GCA	RA	pSS	AS	pSS
Phase of rheumatic diseases		Active	Active	Stable	Active	Stable	Active	Stable	Stable
Rheumatic drugs (last 3 months)		Withdrawal	NSAID 2 tab/d	HCQ 0.4g / d	Pred 45 mg/d , taperd gradually	Withdrawal	Withdrawal	Withdrawal	Pred 5 mg/d+ HCQ 0.4g / d
Comorbidity		LI	Eczema; KS	HUA; RE	CHB; BC; ASD; CAS	Hypothyroi dism	CKD; HCI	PVC	IGT
Route of infection		Community	Community	Family cluster	Nosocomial	Family cluster	Community	Family cluster	Family cluster
Onset of symptoms to diagnosis (d)		15	7	5	3	7	17	3	6
COVID-19	Fever	+	+	+	+	+	+	+	+
	Dyspnea	+	-	-	+	-	+	-	-
	Cough	+	-	-	+	+	-	-	-
	CT+	+	+	-	+	+	+	+	+
	PCR+	+	+	+	+	+	+	+	+
	Severe	+	-	-	+	-	+	-	-
Duration of hospitalisation (d)		11	14	10	7	21	11	5	16
Outcome		Dead	Discharged	Discharged	Dead	Discharged	Dead	Discharged	Discharged

SLE: systemic lupus erythematosus; PR: palindromic rheumatism; pSS: primary Sjögren's syndrome; GCA: giant cell arteritis; RA: rheumatoid arthritis; AS: ankylosing spondylitis; NSAID: non-steroidal anti-inflammatory drugs; HCQ: hydroxychloroquine sulfate; Pred: prednisone; LI: Lacunar infarction; KS: kidney stone; HUA: hyperuricaemia; RE: reflux oesophagitis; CHB: chronic hepatitis B; BC: bronchiectasia; ASD: atrial septal defect; CAS: carotid atherosclerosis; CKD: chronic kidney disease; HCI: history of cerebral infarction; PVC: premature ventricular complexes; IGT: impaired glucose tolerance. +: positive; -: negative. CT+: with imaging features of COVID-19 pneumonia; PCR+: reverse transcriptionepolymerase chain reaction test of COVID-19 nucleic acid: positive.

References

1. FALAGAS ME, MANTA KG, BETSI GI, PAPPAS G: Infection-related morbidity and mortality in patients with connective tissue diseases: A systematic review. *Clin Rheumatol* 2007; 26: 663-70.
2. CHIU YM, CHEN DY: Infection risk in patients undergoing treatment for inflammatory arthritis: non-biologics versus biologics. *Expert Rev Clin Immunol* 2020; 16: 207-28.
3. China NHCo: Guidelines for the diagnosis and treatment of novel coronavirus (2019-ncov) infection by the national health commission (trial version 7). Clinical Education of General Practice 2020; 18: 100-5.
4. FERRO F, ELEFANTE E, BALDINI C *et al*.: Covid-19: The new challenge for rheumatologists. *Clin Exp Rheumatol* 2020; 38: 175-80.
5. China NHCo: Guidelines for the diagnosis and treatment of novel coronavirus (2019-ncov) infection by the national health commission (trial version 5). http://www nhcgovcn/ yzygj/ s7653p/ 202002/ d4b895337e19445f 8d728 fcaf1e3e13a/files/ab-6bec7f93e 64e7f998d802991203cd6pdf 2020.
6. MONTI S, BALDUZZI S, DELVINO P, BELLIS E, QUADRELLI VS, MONTECUCCO C: Clinical course of covid-19 in a series of patients with chronic arthritis treated with immunosuppressive targeted therapies. *Ann Rheum Dis* 2020;79:667-8.
7. FAVALLI EG, INGEGNOLI F: What is the true incidence of covid-19 in patients with rheumatic diseases? *Ann Rheum Dis* 2020 Apr 22 [Online ahead of print].