The frequency and clinical course of COVID-19 infection in children with juvenile idiopathic arthritis

Sirs,

Since a new type of coronavirus pneumonia cases in China began to occur in December 2019, severe acute respiratory virus syndrome coronavirus 2 (SARS-CoV-2), became the most important issue in the world (1-3). The virus spread rapidly throughout the world and the outbreak was defined as pandemic in March 2020 (4, 5). Following the first coronavirus disease-2019 (COVID-19) case, Istanbul became the main center of the disease in Turkey. To date, a total of 220.658 confirmed cases and 5491 COVID-19-related deaths have been reported in our country. Among these reported cases, 7.2% (15.916) were under the age of 15, and 13.8% (30.105) were between 15 to 24 years. So far, 11 cases under 15 years and 8 cases between 15 to 24 years have died (Turkey Ministry of Health COVID-19 Situation Report - 2020, 30th June). With the rapid spread of the virus worldwide, two main questions have arisen:

1. Are patients with rheumatic diseases on biologic treatment at increased risk for severe disease due to their conditions and/or drugs?
2. Should the treatment strategies be changed?

As one of the biggest referral paediatric rheumatology centers, we observed the concerns of our patients related to maintaining their treatments, which led us to investigate the relationship between rheumatic diseases, biologic drugs and COVID-19. We prepared a web-based survey investigating clinical and laboratory findings of our patients during the outbreak. The patients with juvenile idiopathic arthritis (JIA) were asked to fill in the surveys. The questionnaires were also carried out by audio or video calls and face to face during the outpatient visits between 16th April and 15th May 2020.

The study population included 345 patients with JIA (female 60.6%, median age 12.1 years, range: 1.6–23.6 years). There were 8 patients with contact histories with confirmed cases (Table I). Six of them were on biological disease-modifying anti-rheumatic drugs (bDMARDs), 1 was on conventional DMARDs (cDMARDs) and 1 was being followed without treatment. Four of the contacted patients took a SARS-CoV2 polymerase chain reaction test and 2 were positive. Despite having symptoms resembling COVID-19, one of the remaining contacted patients was not admitted to hospital and 3 were asymptomatic. Two confirmed COVID-19 cases, Case 1 and Case 2, were on etanercept and adalimumab, respectively. Both cases had cough, rhinorrhoea, anosmia and dyspnea. Additionally, Case 2 had fatigue, myalgia, arthralgia, headache, diarrhoea and nausea. Chest computed tomography was performed only in Case 1 and it was normal. While case 1 was treated with azithromycin and oseltamivir, case 2 was treated only with hydroxychloroquine. Both patients fully recovered. Neither of them needed hospitalisation or had severe complications.

Table I. Clinical characteristics of the patients with Juvenile idiopathic arthritis.

		Patients on †cDMARDs (n=178)	Patients on ‡bDMARDs (n=167)
Female		112 (62.9)	97 (58.1)
Age (years)		11.2 (1.6-20.8)	13.1 (2.6-23.6)
The person who answered the questionnaire			
	Herself/Himself	18 (10.1)	33 (19.8)
	Mothers	101 (56.7)	67 (40.1)
	Fathers	56 (31.5)	63 (37.7)
	Siblings	3 (1.7)	4 (2.4)
Diagnosis			
	Oligoarticular juvenile idiopathic arthritis	80 (44.9)	53 (31.7)
	Polyarticular juvenile idiopathic arthritis	25 (14)	30 (17.9)
	Systemic juvenile idiopathic arthritis	25 (14)	26 (15.5)
	Juvenile psoriatic arthritis	5 (2.8)	12 (7.1)
	Enthesitis related arthritis	43 (24.1)	46 (27.5)
Treatment			
	Methotrexate	84 (47.2)	56 (33.5)
	Leflunomide	5 (2.8)	18 (10.8)
	Sulphasalazine	8 (4.5)	2 (1.2)
	Anakinra	-	1 (0.6)
	Canakinumab	-	16 (9.6)
	Etanercept	-	86 (51.5)
	Adalimumab	-	42 (25.1)
	Infliximab	-	4 (2.4)
	Tocilizumab	-	19 (11.4)
	Secikinumab	-	1 (0.6)
	Steroids	39 (21.9)	39 (23.3)
SARS-CoV2§ positive family members		2 (1.1)	6 (3.6)
Patients contacted with SARS-CoV2§ positive ones		2 (1.1)	6 (3.6)
Patients who was admitted to hospital due to SARS-CoV2§ suspicion		3 (1.6)	3 (1.8)
Patients that was performed SARS-CoV2§ diagnostic test		1 (0.5)	5 (2.9)
SARS-CoV2§ positive patients		0	2 (1.2)

†Conventional disease-modifying anti-rheumatic drugs; ‡Biological disease-modifying anti-rheumatic drugs; §Severe acute respiratory syndrome coronavirus.

The presence of a small number of patients tested for COVID-19 in our patient group makes it difficult to compare patients on bDMARDs and cDMARDs for the incidence rate of COVID-19. Only 2 of our patients under bDMARDs were positive, and it is consistent with the 1.5% positivity in patients with liver transplantation or receiving chemotherapy (6). In the previous two reports about children with rheumatic diseases on bDMARDs, no positive cases were reported among 54 and 123 patients (7, 8). Although, there are few studies reporting COVID-19 positive adult patients on cDMARDs and/or bDMARDs with various rheumatic conditions, to our best knowledge, these are the first two JIA cases on bDMARDs positive for COVID-19 (9, 10). Despite the immunosuppressive treatment, these two patients did not develop either severe disease course or need hospitalisation.

Our preliminary results support the previously reported low frequency of severe disease complications in paediatric patients with rheumatic conditions and there are no data suggesting the cessation of undergoing treatments in this patient group.

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Competing interests: none declared.

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