

Potential acceptance of COVID-19 vaccine in rheumatological patients: a monocentric comparative survey

Similarly to the general population, advanced age, comorbidities and chronic glucocorticoid treatment (≥ 10 mg/day prednisone-equivalent) have been identified as negative prognostic factors for COVID-19 also in rheumatological patients.^{1,2} Unfortunately, until today, the only effective recommended strategy to reduce the rate of SARS-CoV-2 infection in rheumatological patients has been the application of preventive life-style measures, such as social distancing and the use of personal protective equipment.³ Hopefully, the recently approved COVID-19 vaccines will revolutionise our approach to the pandemic.⁴ Although the details of the COVID-19 vaccination plan are yet to be defined in most EU countries, it is expected that rheumatological patients, together with other groups of patients suffering from chronic diseases, will be considered a priority group.⁵

To investigate the likelihood of COVID-19 vaccine acceptance, we performed a survey in a cohort of consecutive rheumatological patients followed up at our tertiary referral centre in Milan, Italy. A cohort of patients with neoplastic diseases followed up at the Oncologic Department of the same Institution was included as comparator. All patients provided their informed consent for the use of their anonymous data. The details of the self-administered questionnaire are available as an online supplemental material.

Between 23 November and 11 December 2020, a total of 202 rheumatological patients and 68 oncological patients answered to the questionnaire. Table 1 summarises their main demographic and clinical features. Overall, 222 (82%) patients declared to be willing to receive COVID-19 vaccine, with no differences between the two groups: 88 rheumatological (44%) and 26 oncological (38%) patients clearly expressed their willingness ($p=0.48$), while 74 rheumatological (37%) and 34 oncological (50%) patients gave an affirmative answer provided a recommendation by the treating physician ($p=0.06$). The proportions of patients openly opposed or sceptical were also similar (17% vs 9%, $p=0.12$). Interestingly, rheumatological patients had a higher mean score at the likelihood visual analogue scale (7.37 ± 2.68 vs 6.63 ± 2.62 , $p=0.029$). Reasons for declining COVID-19 vaccination among rheumatological patients were fear of adverse reactions ($n=14$) and of rheumatic disease worsening ($n=3$), safety concerns related to the rapidity of vaccine production ($n=6$), doubt on its usefulness ($n=1$), and a generalised vaccine hesitancy ($n=1$). When completing the questionnaire, 25 rheumatological and 2 oncological patients had been already diagnosed with COVID-19; nonetheless, a prior COVID-19 diagnosis did not influence the vaccination acceptance rate (80% in both subgroups). In rheumatological patients, among clinical and demographic factors, only a higher level of education (college and postgraduate degree 92% vs primary and middle school 67%, $p=0.01$) was associated with a greater willingness to get vaccinated. Of interest, concomitant therapies did not correlate with the desire of getting vaccinated. Finally, in both groups, patients who joined 2020 influenza vaccine campaign were keener to get COVID-19 vaccination (90% vs 36%, $p<0.01$).

Although the small number of patients included, a few conclusions can be drawn from this survey. The most reassuring data are the majority of our rheumatological patients consider

Table 1 Demographic and clinical features of rheumatological and oncological patients

	Rheumatological patients n=202	Oncological patients n=68
Female sex, n (%)	106 (39)	30 (44)
Age (years), n (%)		
18–24	5 (2)	0
25–54	83 (41)	12 (18)
55–64	45 (22)	21 (31)
>65	69 (34)	35 (51)
Education, n (%)		
None	2 (1)	0
Primary school	9 (4)	4 (6)
Middle school	54 (27)	12 (18)
High school	95 (47)	32 (47)
College/university	36 (18)	17 (25)
Post-graduate degree	6 (3)	3 (4)
Disease, n (%)		
Rheumatoid arthritis	52 (26)	–
Psoriatic arthritis	27 (13)	–
Ankylosing spondylitis	11 (5)	–
Sjogren's syndrome	13 (6)	–
Systemic lupus erythematosus	8 (4)	–
Systemic sclerosis and inflammatory myositis	25 (12)	–
UCTD	5 (2)	–
ANCA vasculitis and cryoglobulinemia	10 (5)	–
Polymyalgia rheumatica and giant cell arteritis	19 (10)	–
Takayasu's arteritis	8 (4)	–
Adult onset Still's disease	8 (4)	–
IgG4-related disease	7 (3)	–
Other rare diseases*	10 (5)	–
Lung cancer	–	15 (22)
Brain cancer	–	4 (6)
Gastrointestinal cancer	–	33 (49)
Genital cancer	–	2 (3)
Breast cancer	–	14 (21)
Treatment, n (%)		
bDMARDs/tsDMARDs	98 (49)	–
TNF-alpha inhibitors	29 (14)	–
Interleukin-6 inhibitors	10 (5)	–
Rituximab	17 (8)	–
Interleukin-17 inhibitors	12 (6)	–
Interleukin-1 inhibitors	6 (3)	–
JAK-inhibitors	16 (8)	–
Others†	6 (3)	–
csDMARDs	120 (59)	–
Methotrexate	64 (32)	–
Hydroxychloroquine	25 (12)	–
Mycophenolate mofetil	15 (7)	–
Leflunomide	12 (6)	–
Others‡	7 (3)	–
Chemotherapy	–	47 (69)
Radiotherapy	–	2 (3)
Immune checkpoint-inhibitors	–	16 (23)
Glucocorticoids	57 (28)	7 (10)

*Rare diseases: Behçet's disease ($n=4$), Cogan's syndrome ($n=1$), Erdheim-Chester disease ($n=2$), relapsing polychondritis ($n=1$), sarcoidosis ($n=2$).

†Other bDMARDs/tsDMARDs: abatacept ($n=1$), apremilast ($n=2$), belimumab ($n=2$), mepolizumab ($n=2$).

‡Other csDMARDs: azathioprine ($n=3$), cyclosporine ($n=3$), tacrolimus ($n=1$).

.ANCA, anti-neutrophil cytoplasmic antibody; bDMARD, biological disease-modifying antirheumatic drug; csDMARD, conventional synthetic disease-modifying antirheumatic drug; tsDMARD, targeted synthetic disease-modifying antirheumatic drug; UCTD, undifferentiated connective tissue disease.

positively the opportunity of undergoing COVID-19 vaccination and have even a higher likelihood score when compared with oncological patients. Moreover, even though intrinsic factors such as the level of education still play a major determinant role, rheumatologists' recommendations seem to have a fundamental positive influence. This is particularly important for patients concerned about vaccine-induced rheumatic disease worsening who should be reassured that a potential disease flare could be adequately treated after vaccination. To date, recommendations for COVID-19 vaccination in rheumatological patients are still lacking; nonetheless, international societies advise in favour of extensive vaccinations in these groups of patients.⁶ The third millennium 'V-day' has just happened but several months will be needed for a satisfactory coverage. Physicians and patients are in urgent need of coordinated national and international local awareness campaigns to defeat COVID-19 vaccine scepticism and hopefully put an end to this pandemic.

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