Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Commentary

Attitudes toward vaccination in patients with multiple sclerosis: A report from Iran

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1. Introduction

The recent pandemic by the novel coronavirus (SARS CoV-2) has brought up many psychosocial changes among different societies worldwide. Patients with chronic diseases, especially those on immune-modulatory and immune suppressor drugs need special attention. Multiple sclerosis (MS) is a chronic autoimmune disease of the central nervous system. Globally, it is estimated to affect more than 2.8 million people (Walton et al., 2020). Iran, as one of the areas with a significant prevalence of MS (29.3/ 100,000) (Azami et al., 2019), is facing a difficult time. The high incidence and mortality rate of COVID-19 in the country (www.worldometers.info/coronavirus/country/iran/) has raised concerns among MS patients (Rezaeimanesh et al., 2020). Higher rates of depression, interruptions in their psychological supports, changes in their lifestyles, cognitive issues and differences in their coping strategies may add on the disease burden in this group (Costabile et al., 2020). But fortunately, besides following precautions, vaccination has brought hope to the people in every corner of the world. We studied MS patients' attitudes toward vaccination and its effect on their disease.

2. Methods

A pilot questionnaire was filled by two MS patients. After the preliminary edition, the questionnaire was reviewed by four MS experts and one epidemiologist. A link to the google form was made available for MS patients in social networks for one week (19th to 26th of March, 2021).

The questionnaire contained questions about demographic data (age, gender, employment status, education level) and also questions about the patient's disease status (MS type (relapsing-remitting or progressive), MS disease duration since the first symptom, expanded disability status scale (EDSS) and MS medication). Then questions about the patients' attitudes toward vaccination were asked.

IBM SPSS version 26 was used to analyze the data. Descriptive measures were shown in mean ± standard deviation (SD) and percentage for quantitative and qualitative variables respectively. Independent sample T-test, chi-square, and ANOVA were statistical tests that were used where applicable. P-values less than 0.05 were considered statistically significant.

Table 1
Basic characteristics of the patients.

Age (mean ± SD) (year)	36 ± 9.61
Gender:	
Female	85 (77%)
Male	26 (23%)
Employment status:	
Employed	52 (46%)
Unemployed	62 (54%)
Education:	
Without academic degree	25 (22%)
With academic degree	89 (78%)
EDSS (mean ± SD)	2.99 ± 1.80
MS duration (mean ± SD) (year)	8.31 ± 5.91
MS type:	
RR	89 (80%)
Progressive (PP, SP)	23 (20%)
MS medication:	
Interferon Beta-1A (intramuscular)	15 (13.8%)
Interferon Beta-1A (subcutaneous)	9 (8.3%)
Interferon Beta-1B	4 (3.7%)
Glatiramer acetate	18 (16.5%)
Fingolimod	9 (8.3%)
Dimethylfumarat	5 (4.6%)
Teriflunamide	2 (1.8%)
Natalizumab	2 (1.8%)
Rituximab	40 (36.7%)
Ocrelizumab	2 (1.8%)
Cyclophosphamide	2 (1.8%)
Azathioporine	1 (0.9%)

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Table 2
How respondents filled in the questionnaire.

	Strongly disagree	Disagree	No idea	Agree	Strongly agree	Missing
I want to get vaccinated.	6 (5.3%)	3 (2.6%)	32 (28.1%)	40 (35.1%)	32 (28.1%)	1 (0.9%)
Corona vaccination is effective in reducing the incidence of COVID-19 infection.	2 (1.8%)	2 (1.8%)	25 (21.9%)	52 (45.5%)	33 (28.9%)	
Corona vaccination can cause relapse in MS patients.	8 (7%)	24 (21.1%)	71 (62.3%)	10 (8.8%)	0	1 (0.9%)
Corona vaccination can cause disease progression in MS patients.	13 (11.4%)	26 (22.8%)	67 (58.8%)	7 (6.1%)	0	1 (0.9%)
Corona vaccination could have serious side effects.	7 (6.1%)	23 (20.2%)	64 (56.1%)	18 (15.8%)	2 (1.8%)	
Corona vaccination has more side effects in MS patients, compared to healthy individuals.	10 (8.8%)	14 (12.3%)	72 (63.2%)	15 (13.2%)	1 (0.9%)	2 (1.8%)
The effectiveness of corona vaccine in preventing coronary heart disease in patients with MS is similar to healthy individuals.	0	8 (7%)	48 (42.1%)	47 (41.2%)	11 (9.6%)	
Corona vaccine should be a priority for MS patients.	0	1 (0.9%)	35 (30.9%)	40 (35.1%)	38 (33.3%)	

3. Results

Of 733 viewers of the message, totally 114 cases agreed to fill the questionnaire. The basic characteristics of the patients are shown in Table 1. The patients' age ranged from 20 to 62 years old. EDSS scores varied from zero to seven (mean: 2.99 ± 1.80). Most of the patients were female (77%), with an academic degree (78%), diagnosed with relapsing-remitting (RR) form of MS (80%). The most used drug in this population was rituximab (36.7%). No significant difference was found in age, EDSS, and disease duration in different subgroups of gender, education level, and employment status (P-value>0.05). Only two of the patients had been vaccinated at the time of the study.

Twenty-four of the patients had experienced COVID-19. Positive history of COVID-19 was not associated with gender, education, employment status, and MS type (p-value > 0.05).

Pattern of responses to the questions is shown in Table 2. Analyzing responses, it is shown that people with higher education seem to have more positive attitude toward vaccination. This association is shown in these questions:

1 "I want to get vaccinated". Patients with higher education were more willful to get vaccinated (p-value: 0.03).
2 "Corona vaccine could have serious side effects". Patients with higher education disagreed more with this idea (p-value: 0.05).
3 "Corona vaccine has more complications in patients with MS, compared to healthy individuals". Patients with higher education did not believe it is true (p-value: 0.05).

No other variable was associated with the responses.

4. Discussion

The majority of the patients (66%) in this study declared their willingness to get vaccinated. It was associated with higher education. Other studies have found a similar association between level of education and positive opinion about vaccination (Ehde et al., 2021; Dorman et al., 2021; Khubchandani et al., 2021; Nguyen et al., 2021).

MS management has undergone a significant change during the pandemic. The pattern of drug prescription has changed (Morrison et al., 2021; Portaccio et al., 2021), follow-up visits have been reduced or replaced by telemedicine (Portaccio et al., 2021), and access to paramedical facilities may have been limited. The effect of these changes on the disease course is unclear. As lower antibody response has been demonstrated in this population compared to healthy controls, more strict safety measures should be recommended (Capasso et al., 2020). Now that vaccination is proceeding successfully, it seems to be the most promising tool to get us back to normal.

Aside from clinical trials, the real-word effectiveness of vaccination has been shown in different populations (Golob and Lugogo, 2021). No official report of vaccination course is available in Iran to date but MS patients are prioritized in the country. Although adverse effects of vaccines are reported to be minor (Kaur et al., 2021), many are still hesitant to get vaccinated (Kreps et al., 2020). As Sahraian et al. reported, Iranian patients have substantial knowledge of the severity and transmissibility of COVID-19 (Sahraian et al., 2020). But still, as we found, around 35% are hesitant to get vaccinated. As seen in table 2, most of the patients have no idea regarding the effect of vaccination on their disease progression and relapse, and the seriousness of the side effects. This calls for more educational programs addressing the concerns of this group of patients.

5. Conclusion

MS is a chronic disease with a great impact on different aspects of patients' life. Raising knowledge about preventing and coping mechanisms toward the complications could be very helpful. In this regard, vaccination plays an important preventive role in the recent pandemic. This study highlights the importance of education in understanding the value of vaccination during this critical era.

Declaration of Competing Interest

The authors declare there is no conflict of interest.

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