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## ORIGINAL ARTICLE

## SARS-CoV-2 vaccine acceptance among gastroenterologists and inflammatory bowel disease patients: VACUNEII project



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### KEYWORDS

Inflammatory bowel disease;  
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### Abstract

**Introduction:** Several vaccines against SARS-CoV-2 are currently in use and are recommended in inflammatory bowel disease (IBD) patients. Data are scarce about the gastroenterologists and IBD patient's acceptance of SARS-CoV-2 vaccines. The aim of the study was to evaluate the intention to get vaccination with SARS-CoV-2 vaccine among IBD patients from gastroenterologists and patient's perspective.

**Methods:** An online anonymous survey was sent to 8000 patients from ACCU-Spain and 1000 members of the GETECCU. Three invitations were sent between October-December 2020. Descriptive analyses were performed, comparing physicians and patients responses by standard statistical analyses.

**Results:** 144 gastroenterologists [63% female, mean age 43 years (SD 9.5)], and 1302 patients [72% female, mean age 43 years (SD 12)] responded to the survey. 95% of the physicians recommended SARS-CoV-2 vaccine for IBD patients and 87% consider that their vaccination strategies has not changed after the pandemic compared to 12% who considered that they currently refer more patients to vaccination. Regarding to IBD patients, only 43% of patients were willing to

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receive the vaccine and 43% were not sure. Male sex ( $p < 0.001$ ) and mesalazine treatment ( $p = 0.021$ ) were positively associated with SARS-CoV-2 vaccine acceptance. After multivariate analysis, only male sex was significantly associated with vaccination intent (OR = 1.6; 95% confidence interval = 1.2–2.0;  $p = 0.001$ ).

**Conclusions:** Gastroenterologists and patient's perspective about SARS-CoV-2 are different. Future efforts to increase COVID-19 vaccine and decrease unfounded beliefs among IBD patients are needed.

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## PALABRAS CLAVE

Enfermedad inflamatoria intestinal;  
SARS-CoV-2;  
Vacuna;  
Aceptación;  
Rechazo

## Aceptación de la vacuna frente a SARS-CoV-2 entre gastroenterólogos y pacientes con enfermedad inflamatoria intestinal: proyecto VACUNEII

### Resumen

**Introducción:** Actualmente en el mercado hay diferentes vacunas frente a SARS-CoV-2 que se recomiendan en pacientes con enfermedad inflamatoria intestinal (EII). No tenemos suficiente evidencia sobre la aceptación de este tipo de vacunas. El objetivo del estudio fue evaluar la aceptación de la vacuna frente a SARS-CoV-2 por parte de gastroenterólogos y pacientes con EII.

**Métodos:** Se realizó una encuesta online a 8.000 pacientes de ACCU-España y 1.000 miembros de GETECCU. Se enviaron tres invitaciones entre octubre y diciembre de 2020. Se realizó un análisis descriptivo, comparando las respuestas de médicos y pacientes.

**Resultados:** 144 gastroenterólogos (63% mujeres, edad media 43 años [DE 9,5]) y 1.302 pacientes (72% mujeres, edad media 43 años [DE 12]) respondieron a la encuesta. El 95% de los médicos recomendaban la vacuna frente a SARS-CoV-2 en pacientes con EII, el 87% consideraron que su estrategia de vacunación frente a diferentes vacunas no había cambiado tras la pandemia, frente al 12% que consideraban que actualmente remitían más pacientes a vacunación. En cuanto a los pacientes con EII, solo el 43% aceptaban la vacunación frente a SARS-CoV-2, frente al 43% que no estaban seguros. El sexo masculino ( $p < 0,001$ ) y el uso de mesalazina ( $p = 0,021$ ) se asoció de forma positiva con la aceptación de la vacuna. En el análisis multivariante, solo el sexo masculino fue asociado significativamente con la intención de vacunarse (OR = 1,6; IC 95% = 1,2-2,0;  $p = 0,001$ ).

**Conclusiones:** La perspectiva de gastroenterólogos y pacientes con EII con respecto a la vacunación frente a SARS-CoV-2 es diferente. Es necesario realizar esfuerzos para incrementar el uso de la vacuna y disminuir falsas creencias.

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## Introduction

The emergence of the SARS-CoV-2 pandemic has triggered a public health crisis with a tremendous impact in our societies and the whole healthcare assistance. The recent development of vaccines against this microorganism and the implementation of mass vaccination programs could be a great opportunity for controlling viral transmission.<sup>1,2</sup> Several vaccines against SARS-CoV-2 are already available and are recommended for the whole population.<sup>3</sup> Recent evidence has demonstrated that patients with inflammatory bowel disease (IBD) have the same risk of suffering COVID-19 as their background population,<sup>4</sup> and international experts recommend the vaccination of these patients according to national guidelines.<sup>1</sup> However, vaccine hesitancy by patients and caregivers can have a big impact in the course of the illness. There is still scarce data about the gastroenterologist and IBD patients' acceptance of those vaccines. The

aim of this study was to evaluate the intention to get vaccinated with SARS-CoV-2 vaccine among patients with IBD and correlate it with the gastroenterologists and patients' perspective.

## Patients and methods

A collaborative study between the Spanish IBD Working Group (GETECCU) and the national patient association (ACCU Spain) which included two separate online surveys was performed. One survey was specifically designed for addressing IBD patients' perspective and a second version was focused on physician's opinions. They included demographic, clinical characteristics and three specific questions about SARS-CoV-2 for patients and two for physicians. The anonymous surveys were uploaded to the online platform SurveyMonkey and sent by email to approximately 8000 patients from a national ACCU Spain and 1000 members of

GETECCU, and it was also shared through the social media accounts of both organizations. Three invitations were sent between October and December 2020, before the initiation of the nationwide SARS-CoV-2 vaccination programme. By default, the survey allowed only one response per browser or email address.

In the descriptive analysis, continuous variables were expressed as mean and standard deviation (SD). For categorical variables, the number of observations and percentages were given for each category. Qualitative variables were compared using the Chi-square test for polytomous variables or Fisher's test for dichotomous variables. We performed a multivariate logistic regression model to identify variables independently associated with SARS-CoV-2 vaccine acceptance in IBD patients using the following characteristics: age, gender, type of IBD, type of healthcare and treatment. The results were considered to be significant at a *p* level below 0.05. All statistical analysis were conducted using SPSS version 26 for Windows (SPSS, Inc., Chicago, IL, USA) and R (v4.0.0).

The local Ethics Committee of Galicia (Santiago de Compostela, Spain) approved the study (2020/415) and it was performed according to the Declaration of Helsinki, all its amendments, and according to national regulations.

## Results

A total of 144 (14%) gastroenterologists and 1,302 (16%) patients responded to the survey. The patients and gastroenterologists' clinical and sociodemographic characteristics are shown in Table 1. The results of the SARS-CoV-2 vaccine questionnaire in IBD patients and gastroenterologists are summarized in Table 2. The vast majority of physicians (135, 95%) would recommend SARS-CoV-2 vaccination for IBD patients.

Regarding IBD patients, only 404 patients (43%) were willing to receive the vaccine and 407 (43%) were doubtful. In the univariate analysis, male sex and treatment with aminosalicilates were positively associated with SARS-CoV-2 vaccine acceptance. Female sex was associated with the idea that the influenza or pneumococcal vaccines prevented SARS-CoV-2 infection. After multivariate analysis, male sex was the only factor significantly associated to the willingness to receive SARS-CoV-2 vaccination (OR 1.56; 95% confidence interval, 1.19–2.20; *p* = 0.001 [Table 3]).

## Discussion

Despite physicians demonstrated a widespread acceptance of SARS-CoV-2 vaccine, our survey shows insufficient levels of willingness to accept vaccination by IBD patients. The current recommendations from the International Organization for the study of Inflammatory Bowel Disease (IOIBD) is to vaccinate all patients with IBD regardless of their treatment in order to ensure maximal protection from COVID-19 to both the individual and the whole community.<sup>1</sup> Despite the impressive results from the clinical trials evaluating the currently available vaccines, there is still some people opposed to this preventive measure and several important questions remain unclear in IBD patients.<sup>2</sup>

**Table 1** Clinical and sociodemographic data.

Patients	
Age, years, mean (SD)	43 (12)
Gender, female, n (%)	942 (72)
Type of inflammatory bowel disease, n (%)	
Crohn's disease	753 (58)
Ulcerative colitis	521 (40)
Unclassified colitis	29 (2)
Type of healthcare coverage, n (%)	
Public	1.192 (91)
Private	64 (5)
Both	55 (4)
Treatment, n (%)	
5-ASA	545 (42)
Corticosteroids	100 (8)
Azathioprine/methotrexate	458 (35)
Biologics	650 (49)
Tofacitinib	7 (0.5)
No treatment	97 (7)
Gastroenterologists	
Age, years, mean (SD)	43 (9)
Gender, female, n (%)	90 (63)
Third level hospital, n (%)	67 (47)
Type of hospital, n (%)	
Public	128 (89)
Private	4 (3)
Both	12 (8)
Total average number of IBD patients per physician, n (%)	
<200	51 (36)
200–500	55 (38)
>500	37 (26)
Years of experience treating patients with IBD, n (%)	
<5	29 (20)
5–15	76 (47)
>15	47 (33)
Type of consultation, n (%)	
IBD unit	101 (71)
General gastroenterology	42 (29)

IBD: inflammatory bowel disease.

In the majority of surveys performed among the general population, the acceptance rates of SARS-CoV-2 vaccination have been described to be over 70%.<sup>5,6</sup> However, our study suggests a lower vaccination intent among IBD patients, with only 43% of patients willing to receive this vaccination. This is in contrast with the severity of the infection, death rate and social disruption secondary to the COVID-19 pandemic. However, this is in line with previous reports on the low adherence to the current general vaccine recommendations in IBD.<sup>7</sup> Recently, Dalal et al. showed high rates (80%) of SARS-CoV-2 vaccination intent among IBD patients in the USA.<sup>8</sup> These authors also observed that white patients, those aged  $\geq 50$  years, with higher degree of education, reporting prior COVID-19 infection, and those under biologic therapy were more likely to have vaccination intent. Importantly,

**Table 2** Survey results of SARS-CoV-2 vaccine questionnaire in inflammatory bowel disease patients and gastroenterologists.

<i>Patients</i>	
<i>Acceptance of SARS-CoV-2 vaccination, n (%)</i>	
Yes	404 (43)
No	126 (14)
Not sure	407 (43)
<i>Increased concern about vaccination since pandemic, n (%)</i>	
No	584 (63)
Yes, I have tried to know or get vaccinated about pending vaccination	279 (30)
Yes, I am avoiding vaccination	69 (7)
<i>Belief of influenza and pneumococcal vaccines prevent SARS-CoV-2 infection</i>	
No, there is no relationship	283 (30)
No, it can increase the risk of SARS-CoV-2	18 (2)
Yes, it can decrease the risk of SARS-CoV-2	169 (18)
Yes, it can avoid the risk of SARS-CoV-2	4 (0.4)
I don't know	462 (49)
<i>Gastroenterologists</i>	
<i>Would you recommend SARS-CoV-2 vaccination for IBD patients?</i>	
Yes, n (%)	135 (95)
<i>Do you consider that your vaccination strategies have changed since the onset of the pandemic?, n (%)</i>	
Yes, I refer more patients to vaccination	17 (12)
Yes, I recommend fewer vaccines than before the pandemic	2 (1)
No	123 (87)

IBD: inflammatory bowel disease.

**Table 3** Multivariate analysis of factors associated with acceptance of SARS-CoV-2 vaccination among inflammatory bowel disease patients.

	Odds ratio	95% confidence interval	p-Value
Age	1.008	0.998–1.019	.119
Gender (male)	1.556	1.194–2.027	.001
Type of inflammatory bowel disease (Crohn's disease)	0.851	0.631–1.147	.290
Type of healthcare (private)	1.277	0.738–2.210	.382
Type of healthcare (both)	0.591	0.290–1.204	.147
5-ASA	1.317	0.947–1.832	.102
Azathioprine	0.891	0.675–1.175	.412
Biologics	1.011	0.753–1.357	.942
Corticosteroids	0.849	0.538–1.339	.482
No treatment	1.186	0.676–2.083	.552

those patients reporting hesitancy towards vaccination were mainly related to safety concerns. It is possible that this high rate was overestimated because a short study period. In contrast, we have observed that male participants were more likely to accept the vaccine. These differences may have been also influenced by the differences between both healthcare systems and the time when the study was performed, as this survey was carried out before the start of the national vaccination programme over a period of uncertainty regarding the rapid development and approval of the first available vaccines.

Our results show that despite more physicians encourage their patients to get vaccinated and this proportion is even higher since the onset of the pandemic, many patients are

still hesitant to receive the SARS-CoV-2 vaccine. Moreover, women were more likely to believe that influenza or pneumococcal vaccine may prevent SARS-CoV-2 infection. These false beliefs may have a relevant negative impact on the vaccination intent. The importance of correct awareness of IBD patients to get vaccinated is expected to reduce considerably the morbidity and mortality related to SARS-CoV-2.<sup>9</sup> Therefore, the current recommendations to the general population apply to patients with this condition.

This survey has some limitations that should be addressed. First, the inclusion of patients and physicians only from active members of their respective societies may be not representative of the entire IBD population as participants could be members with a higher adherence to the

vaccination guidelines. Moreover, this survey was performed weeks before a vaccine was available, so the reasons to their behavior were not well explored. However, some strengths of the current study should be emphasized including that, to our knowledge, this is the largest survey published in IBD patients about the acceptance of this vaccination. In addition, our findings are supported by their wide perspective on this topic as both physician and patients' perspective were included.

In summary, gastroenterologists and patients' perspectives about SARS-CoV-2 are different. Future efforts to increase SARS-CoV-2 vaccine confidence and awareness, improvement of its acceptance and decrease misinformation and unfounded beliefs are needed to ensure high compliance rates among IBD patients.

### Authors' contributions

RF-I and AH: study concept and design, acquisition of data, analysis and interpretation of data; drafting of the manuscript.

RSL: survey dissemination and critical revision of the manuscript.

IR-L, YZ and MB: drafting and critical revision of the manuscript.

### Data availability

The data underlying this article will be shared on reasonable request to the corresponding author.

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None.

### Conflicts of interest

RF-I has served as a speaker, or has received research or education funding from AbbVie, Takeda, MSD, Pfizer, Janssen, Adacyte, Ferring, Casen Recordati, Palex, Tillotts Pharma, Dr. Falk, Shire Pharmaceutical, Faes Farma.

AH-C has served as a speaker, or has received research or education funding from AbbVie, Takeda, Kern Pharma, Pfizer, Janssen, Adacyte and Ferring.

RSL has no conflicts of interest to declare.

IR-L has received financial support for travelling and educational activities from or has served as an advisory

board member for MSD, Pfizer, AbbVie, Takeda, Janssen, Tillotts Pharma, Shire Pharmaceuticals, Roche, Celltrion, Faes Farma, Ferring, Dr. Falk, Otsuka, Adacyte.

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MB-A has served as a speaker, consultant and advisory member for or has received research funding from MSD, AbbVie, Janssen, Kern Pharma, Celltrion, Takeda, Gilead, Celgene, Pfizer, Sandoz, Biogen, Fresenius, Ferring, Faes Farma, Dr. Falk, Chiesi, Gebro Pharma, Adacyte and Vifor Pharma.

### References

1. Siegel CA, Melmed GY, McGovern DP, Rai V, Krammer F, Rubin DT, et al. SARS-CoV-2 vaccination for patients with inflammatory bowel diseases: recommendations from an international consensus meeting. *Gut*. 2021;70:635–40.
2. Alexander JL, Moran GW, Gaya DR, Raine T, Hart A, Kennedy NA, et al. SARS-CoV-2 vaccination for patients with inflammatory bowel disease: a British Society of Gastroenterology and IBD Clinical Research Group position statement. *Lancet Gastroenterol Hepatol*. 2021;6:218–24.
3. Kucharzik T, Ellul P, Greuter T, Rahier JF, Verstockt B, Abreu C, et al. ECCO guidelines on the prevention, diagnosis, and management of infections in inflammatory bowel disease. *J Crohns Colitis*. 2021, jjab052. Online ahead of print.
4. Taxonera C, Sagastagoitia I, Alba C, Mañas N, Olivares D, Rey E. 2019 novel coronavirus disease (COVID-19) in patients with inflammatory bowel diseases. *Aliment Pharmacol Ther*. 2020;52:276–83.
5. Lazarus JV, Ratzan SC, Palayew A, O Gostin L, Larson HJ, Rabin K, et al. A global survey of potential acceptance of a COVID-19 vaccine. *Nat Med*. 2021;27:225–8.
6. Sallam M. COVID-19 vaccine hesitancy worldwide: a concise systematic review of vaccine acceptance rates. *Vaccines (Basel)*. 2021;9:160.
7. Ruiz-Cuesta P, Gonzalez-Alayon C, Jurado-Garcia J, Iglesias-Flores EM, Barranco-Quintana JL, Garcia-García L, et al. Adherence to a predefined vaccination program in patients with inflammatory bowel disease. *Gastroenterol Hepatol*. 2016;39:385–92.
8. Dalal RS, McClure E, Marcus J, Winter RW, Hamilton MJ, Allegretti JR. COVID-19 vaccination intent and perceptions among patients with inflammatory bowel disease. *Clin Gastroenterol Hepatol*. 2021. S1542-3565(21)00105-1.
9. Doornekamp L, van Leeuwen L, van Gorp E, Voeten H, Goeijenbier M. Determinants of vaccination uptake in risk populations: a comprehensive literature review. *Vaccines*. 2020;8:480.