



BRIEF COMMUNICATION

Attitudes towards COVID-19 vaccination in patients with inflammatory bowel disease

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Key words

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Abstract

The majority of the Australian public are willing to have a Coronavirus disease 2019 (COVID-19) vaccination. It is unclear whether people with inflammatory bowel disease (IBD) have the same attitude towards COVID-19 vaccination. A survey was performed to assess the attitude of patients with IBD towards COVID-19 vaccination in South Australia. Two-thirds of surveyed patients with IBD were willing to accept COVID-19 vaccine. Females and younger patients were less likely to accept the COVID-19 vaccine, as were those who had never had a discussion around vaccines.

Medical therapies including immunomodulators and biologics render patients with inflammatory bowel disease (IBD) more susceptible to infection.¹ Accordingly, it is recommended that patients with IBD should remain up to date with routine vaccinations, including the influenza and pneumococcal vaccinations.² Despite the protective benefits, vaccine uptake in patients with IBD is often suboptimal.³

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a highly transmissible virus that has caused a global pandemic, including over 30 000 cases of infections in Australia and over 191 million individuals worldwide, resulting in more than 4.1 million deaths.⁴ A global effort to develop effective vaccines and mass population vaccination programmes has ensued. Early data from the SECURE-IBD registry suggest that corticosteroids, thiopurine monotherapy and thiopurine in combination with anti-tissue necrotic factor alpha inhibitor therapy are associated with increased risk of severe infection with Coronavirus disease 2019 (COVID-19).⁵

The Pfizer/BioNTech COVID-19 vaccine and the Oxford/AstraZeneca COVID-19 vaccine have been provisionally approved for use in Australia, while the Moderna COVID-19 vaccine is under Therapeutic Goods Administration review.⁶ A survey of 2018 Australian adults in June 2020 showed that 24% were unsure or unwilling to have COVID-19 vaccination.⁷

It is unclear whether people with IBD have the same attitude towards COVID-19 vaccination, compared to that of the general public. A significant proportion of patients with IBD believed that vaccination would worsen their IBD and that patients with immunosuppressive therapy should avoid all vaccinations.³ Both the British Society of Gastroenterology and Gastroenterology Society of Australia strongly support COVID-19 vaccines for patients with IBD.^{8,9}

The aim of this study is to assess the attitudes of patients with IBD towards SARS-CoV-2 (COVID-19) vaccination. This will then inform healthcare providers as to whether any specific interventions are needed to optimise vaccine uptake among patients with IBD.

The survey was carried out within the two IBD services that care for approximately 1500 patients. All adult patients (aged ≥16 years) with IBD who attended an IBD clinic during the study period, or who had consented to

Abbreviations: COVID-19, corona virus disease of 2019; IBD, inflammatory bowel disease; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2

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receiving medical information via email, were invited to participate.

The survey comprised 15 questions pertaining to demographics, disease characteristics, past vaccination history

Box 1 Patient survey: Attitudes towards COVID-19 vaccination in patients with inflammatory bowel disease (IBD)

1. Your current age:
 - a 16–25 years
 - b 26–35 years
 - c 36–45 years
 - d 46–55 years
 - e 56–65 years
 - f 66 years and above
2. Your gender:
 - a Male
 - b Female
 - c Prefer not to answer
3. Your highest educational achievement
 - a High school (no certificate)
 - b High school certificate
 - c TAFE/university
 - d Postgraduate degree
4. Have you ever been infected with COVID-19?
 - a Yes. Approximate month/year:
 - b No
5. Your IBD diagnosis:
 - a Ulcerative colitis
 - b Crohn disease
 - c IBD-unspecified
 - d I am not sure.
6. When was your IBD diagnosed approximately:
 - a Less than 2 years ago
 - b 2–5 years ago
 - c 6–10 years ago
 - d 10–20 years ago
 - e More than 20 years ago
7. Your current medications for IBD (you can choose more than one answer – note, generic medicine names are given with brand names in brackets)
 - a Infliximab (Remicade, Inflectra)
 - b Adalimumab (Humira)
 - c Golimumab (Simponi)
 - d Vedolizumab (Entyvio)
 - e Ustekinumab (Stelara)
 - f Azathioprine (Imuran) or Mercaptopurine (6MP/Purinethol)
 - g Methotrexate
 - h Mesalazine tablets/capsules/granules orally (Pentasa, Mezavant, Salofalk)
 - i Sulfasalazine tablets orally (Salazopyrin)
 - j Mesalazine suppositories or enemas (Pentasa, Salofalk)
 - k Steroid suppositories or enemas (Predsol)
 - l Prednisone tablets
 - m Budesonide tablets/capsules (Entocort, Budenofalk, Cortiment)
 - n Trial drug

- o I am not sure
8. Do you have other medical conditions/illnesses (you may choose more than one answer)?
 - a Heart failure/heart attack/other heart problems
 - b Emphysema/chronic obstructive pulmonary disease/other lung problems
 - c Chronic kidney disease
 - d Diabetes
 - e Other medical conditions/illnesses:
 - f No
9. Have you ever had the flu (influenza) vaccine?
 - a Yes – approximate month/year:
 - b No – please give reasons if possible:
 - c I am not sure
10. Have you ever had Pneumovax ('pneumonia vaccine')?
 - a Yes – approximate month/year:
 - b No – please give reasons if possible:
 - c I am not sure
11. Have you ever talked to your doctors/nurses about vaccines that you may need?
 - a Yes
 - b No – please give reasons if possible:
 - c I am not sure
12. COVID-19 vaccines are available and free in Australia. Will you have COVID-19 vaccination when it becomes available to you?
 - a Yes – please go to question 13
 - b No – please go to question 14
 - c I do not know/unsure – please go to question 14
13. Why do you want to have COVID-19 vaccination (you may choose more than one answer)?
 - a It is good for me
 - b It is suggested by my doctors
 - c It is suggested by my friends/family
 - d It is on social media/newspaper
 - e It is the government policy
 - f It may be required to travel overseas
 - g It helps to protect others through herd immunity
 - h Other:
14. Why do you *not* want to have COVID-19 vaccination (you may choose more than one answer)?
 - a I want to discuss with my doctors/nurses before having it
 - b I am not sure of the vaccine's side-effects
 - c I do not need/want it
 - d It is unsafe/harmful to me
 - e It is not effective
 - f Other – please give reasons:
15. How do you receive information about COVID-19 vaccination (you may choose more than one answer)?
 - a Through my doctors/nurses
 - b Through government website/information
 - c Through social media: Facebook/Twitter
 - d Through friends/family
 - e Through newspaper
 - f Through Crohn and Colitis Australia
 - g I do not want to know about it
 - h Other:

and patients' attitudes towards COVID-19 vaccination (Box 1). Patients were invited to participate via email (via SurveyMonkey) or in person at their IBD clinics. The

Table 1 Patients' characteristics and COVID-19 vaccination willingness response

Variable	COVID-19 vaccination willingness response, <i>n</i> (%)		Total (<i>n</i>)	<i>P</i> -value†
	Yes	No		
Total group	224 (65.9)	116 (34.1)	340	NA
Age group (years)				
16–25	14 (48.2)	15 (51.8)	29	0.015
26–35	43 (61.4)	27 (38.6)	70	
36–45	47 (64.3)	26 (35.7)	73	
46–55	41 (59.4)	28 (40.6)	69	
56–65	52 (75.3)	17 (24.7)	69	
≥66	27 (90.0)	3 (10.0)	30	
Gender				
Male	108 (73.4)	39 (26.6)	147	0.011‡
Female	113 (60.1)	75 (49.9)	188	
Prefer not to say	3 (60.0)	2 (40.0)	5	
Education achievement				
High school without certificate	29 (59.1)	20 (40.9)	49	0.126
High school certificate	33 (68.7)	15 (31.3)	48	
TAFE/Uni	123 (67.9)	58 (32.1)	181	
Postgraduate degree	39 (62.9)	23 (37.1)	62	
History of COVID-19 infection				
Yes	1	0	1	>0.999
No	223	116	339	
IBD diagnosis				
UC	79 (67.5)	38 (32.5)	117	0.159
CD	134 (64.7)	73 (35.3)	207	
IBD-u	8	3	11	
Not sure	3	2	5	
Duration of IBD				
<2 years	18 (62.0)	11 (38.0)	29	0.056
2–5 years	41 (69.4)	18 (30.6)	59	
6–10 years	55 (67.0)	27 (33.0)	82	
>10 years	110 (64.7)	60 (35.3)	170	
IBD medications				
Biologic or immunomodulators	168 (67.7)	80 (32.3)	248	0.235
No biologic and no immunomodulators	56 (60.8)	36 (39.2)	92	
History of influenza vaccine				
Yes	206 (68.4)	95 (31.6)	301	0.006
No	18 (46.1)	21 (53.9)	39	
History of Pneumococcal vaccine				
Yes	72 (81.8)	16 (18.2)	88	0.0002
No	152 (60.3)	100 (39.7)	252	
Discussion with care provider about vaccine in general				
Yes	157 (71.0)	64 (29.0)	221	0.006
No	67 (56.3)	52 (43.7)	119	

†*P*-value calculated via either chi-squared or Fisher's exact test for comparisons between two groups, and two-way analysis of variance for comparisons between more than two groups.

‡Only compared male versus female; group where gender was not specified was not compared in this analysis.

CD, Crohn disease; COVID-19, corona virus infectious disease 2019; IBD, inflammatory bowel disease; IBD-u, inflammatory bowel disease-unspecified; NA, not applicable; UC, ulcerative colitis.

survey was open from 26 March to 10 April 2021. Ethical approval was obtained through the Central Adelaide Local Health Network Human Research Ethics Committee.

The primary outcome was the proportion of patients who were willing to undergo COVID-19 vaccination. Secondary outcomes included the proportion of patients willing to undergo COVID-19 vaccination according to individual variables, such as gender, age, educational

status, type of IBD, duration of IBD, type of current IBD medication(s) and previous vaccine exposure; the factors associated with patients willing or not willing to receive COVID-19 vaccination; the proportion of patients who had discussed vaccines required with a health care professional; and the proportion of patients who had previously received influenza vaccination and/or pneumococcal vaccination.

In terms of statistical analysis, for individual variable proportion comparisons between two groups, Chi-squared test with a two-tailed result was used, except for small sample sizes ($n < 5$) when Fisher's exact test was used. Two-way analysis of variance was used for comparisons between multiple groups. GraphPad Prism (version 9.1.1; San Diego, CA, USA) was used for statistical analysis.

Of 937 patients invited, 340 responses (322 online, 18 on paper) were received. Detailed characteristics of respondents are presented in Table 1. The majority of participants were female (55.2%), of Crohn disease phenotype (60.8%), aged ≤ 55 years (70.8%), yet with longstanding disease (74.1% more than 5 years) and receiving either immunomodulatory or biologic therapy (72.9%).

Nearly two-thirds ($n = 224$; 65.9%) of patients were willing to receive a COVID-19 vaccine. Factors associated with willingness included male gender versus female: 73.5 versus 60.1% ($P = 0.011$); older age (≥ 55 years vs < 55 years: 79.8 vs 60.2%; $P = 0.0006$); those previously receiving pneumococcal or influenza vaccination(s) (vs no history of these vaccines: flu 68.5 vs 46.2%; $P = 0.007$); pneumococcal 81.8 vs 60.3%; $P = 0.0002$); and those who had reported discussion with their healthcare providers about vaccination versus never discussed: 71.0 versus 56.3% ($P = 0.008$). There were no significant associations between the willingness to accept COVID-19 vaccine and level of education, type of IBD, duration of IBD or IBD medications.

The respondents who were willing to have COVID-19 vaccine (65.9%) were asked to provide reasons for their willingness to receive COVID-19 vaccination. The most common reasons were to help to achieve herd immunity (30.1%), personal belief of benefit of the vaccine (23.9%), following advice of health care professionals (17.8%) and a possible requirement to travel overseas (17.6%). Other reasons to accept the vaccine included suggestion from friend, social media influence and following governmental advice.

Of those (34.9%) who were not willing to receive the COVID-19 vaccine, 39.5% were concerned of vaccine side-effects and potential harm, 29.5% chose not to have it without explanation and 27.2% requested to have more discussion with care providers about the vaccine prior to accepting the vaccine.

Participants were asked whether they had sought information regarding COVID-19 vaccination from specific sources. Patients were more likely to be willing to accept COVID-19 vaccination if they had consulted with doctors/nurses about it (71.4% willing for vaccine vs 59.5% willing of those who had not consulted with doctors/nurses; $P = 0.021$) or government website (72.6 vs 55.3%; $P = 0.001$). They were less likely if they had consulted social media (53.8 vs 69.6%; $P = 0.009$) or friends/family (50.0 vs 68.8%; $P = 0.008$). There was no difference in

willingness for COVID-19 vaccination among patients who sought information from newspapers or through the patient organisation Crohn Colitis Australia.

The majority (88.5%) of patients had previously received influenza vaccination, although only 25.9% had previously received pneumococcal vaccination. Only 65.0% of patients had previously discussed vaccination with their healthcare provider.

Discussion

The majority (65.9%) of patients with IBD surveyed in this study, a population with largely longstanding disease and on immunomodulators or biologic therapies, were willing to accept COVID-19 vaccination. While the rates of vaccine acceptance are a little lower than a recent survey of the Australian public, the data expose the vital role of healthcare providers in communicating the importance of COVID-19 vaccination in patients with IBD.⁷

The survey data identified a subgroup of patients with IBD (females and age ≤ 55 years) who were less likely to accept COVID-19 vaccination, which mirrors findings in the general Australian public.⁷ This could be due to increasing COVID-19 misinformation and conspiracy theories on social media, which this group are more likely being exposed to. Therefore, it is important for healthcare providers to be proactive and pay more attention to this group to increase COVID-19 vaccine uptake.

An important outcome of this survey is the point that those who had had discussions with their healthcare providers about vaccinations, as well as those who had previously had influenza or pneumococcal vaccination, were more likely to accept COVID-19 vaccination. In addition, the most common reason for not accepting COVID-19 vaccines were concerns of vaccine safety and request of more discussion with healthcare providers prior to accepting the COVID-19 vaccine. This reinforces the importance of education and discussion about vaccines at consultation in IBD clinics.

Influenza and pneumococcal vaccination are recommended in patients with IBD. The present study showed that the majority (88.5%) of patients with IBD had a history of influenza vaccine uptake but only 25.9% of patients had a history of pneumococcal vaccination. This was significantly higher than that of a survey in Canada in 2015, 61.3 and 10.3% respectively.³ These data indicate variable compliance with Australian vaccination recommendations in IBD, and further education to patients and primary healthcare providers should be considered.

The timing of the survey capture is imperative to the interpretation of results. COVID-19 vaccine hesitancy has been fluctuating across Australia depending on the location and timing of surveys in relation to the COVID-19

threat at the time. The Melbourne Institute (University of Melbourne) has been conducting nationwide surveys 'taking the pulse of the nation' with regards to attitudes towards COVID-19 vaccination.¹⁰ At the time of our presented survey (26 March to 10 April 2021), COVID-19 vaccine hesitancy was 24.77%, to 28.56% in South Australia, which was the second lowest compared with that other states in the country. The COVID-19 vaccination willingness of 65.9% in our presented IBD population is equivalent to 34.1% vaccine hesitancy, which is slightly higher than that of the general SA population reported contemporaneously.

At the time of our survey, there were case reports of thrombosis related to the AstraZeneca vaccine in Europe. The Australian government advised caution against the AstraZeneca vaccine in people younger than 50 years on the last days of our survey that might have influenced patients' responses.

With regards to the status of the pandemic within South Australia at the time of this survey, there had only been 665 reported cases of COVID-19 infection within the state as of 10 April 2021, and daily case numbers were always ≤ 5 , usually 0–2, with no active community transmission.¹¹ Furthermore, there had been no lockdown restrictions in South Australia for 4 months prior to our survey. Hence, anxiety regarding the COVID-19 pandemic threat might have been lower than seen in other populations around the country, especially within the Eastern states where significant community transmission was occurring. This lack of perceived threat may have reduced willingness to participate in COVID-19 vaccination.

Our study has several limitations. In the setting of 30% questionnaire completion, the findings are subject to responder bias. As such, patients on immunosuppressive therapy are over-represented in this survey. However, the anonymous survey was sent to all patients in the IBD network across two tertiary hospitals and the responder demographics are representative of the broad cohort. Generalisability and outcomes of these survey findings will be validated in a further survey in 12 months after the roll out of the COVID-19 vaccine. In addition, because of the anonymous nature of the survey, demographics of survey responders versus non-responders are not known.

In conclusion, two-thirds of surveyed patients with IBD were willing to accept COVID-19 vaccine. This is despite (or perhaps because of) the majority of patients being on immunomodulators and/or biologic therapy. Females and younger patients were less likely to accept the COVID-19 vaccine, as were those who had never had a discussion around vaccines. This highlights the importance of IBD clinicians' roles in engaging with our patients in discussions regarding vaccination.

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