

A Case of Eosinophilic Colitis after BNT162b2 mRNA COVID-19 Vaccination

Selva Yuwaraj Vadioaloo¹, Mazura Mohamed Zahidi², Phei Oon Tan^{1,3}

¹ Division of Gastroenterology and Hepatology, Department of Medicine, Raja Permaisuri Bainun Hospital, Ipoh, Malaysia

² Department of Pathology, Raja Permaisuri Bainun Hospital, Ipoh, Malaysia

³ GI Function & Motility Unit, Department of Medicine, Universiti Sains Malaysia Hospital, Kota Bharu, Malaysia

CORRESPONDENCE

Selva Yuwaraj Vadioaloo

Raja Permaisuri Bainun Hospital
30450 Ipoh, Malaysia
Tel: +60 520 850 00
E-mail: drselva87@gmail.com

ARTICLE HISTORY

Received: May 21, 2022
Accepted: June 28, 2022

ABSTRACT

Background: BNT162b2 is a widely used mRNA COVID-19 vaccine for which 8.2% of participants above the age of 56 years have reported diarrhea as an adverse event. This case report highlights the possibility of eosinophilic colitis in post-vaccination diarrhea. **Case report:** A 72-year-old male patient presented with generalized colicky abdominal pain and acute diarrhea after receiving the first dose of the BNT162b2 vaccine. Laboratory examination revealed peripheral blood eosinophilia with cecal and ascending colon mucosal eosinophilia with 100–130 cells/HPF and eosinophilic cryptitis. The patient's symptoms and eosinophilia resolved spontaneously and did not recur after the second dose of vaccination. More research is needed to confirm eosinophilic colitis as a possible vaccine adverse reaction.

Keywords: COVID-19 vaccine, eosinophilic colitis, vaccine adverse reactions

INTRODUCTION

Vaccines are considered the most promising approach in managing the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic and are being vigorously pursued.¹ One widely utilized vaccine is the BNT162b2 mRNA COVID-19 vaccine, for which diarrhea was listed as one of the adverse events in 8.2% of participants older than 56 years.²

CASE REPORT

We present the case of a 72-year-old Chinese male patient with underlying hypertension, atrial fibrillation with cerebrovascular stroke, and post-stroke seizures who presented with generalized colicky abdominal pain and acute diarrhea after receiving the first dose of the BNT162b2 vaccine. The diarrhea (Bristol Stool Form Scale type 6-7), occurring 4–5 times a day, started 6 hours after receiving the first vaccine dose and lasted for eight days. The patient reported no per rectal bleeding or mucus, and the diarrhea did not improve with self-administered loperamide. He denied any allergy history or other symptoms. His past medications

Phei Oon Tan • Raja Permaisuri Bainun Hospital,
30450 Ipoh, Malaysia. Tel: +60 520 850 00, E-mail:
tanpo83@gmail.com

Mazura Mohamed Zahidi • Raja Permaisuri Bainun
Hospital, 30450 Ipoh, Malaysia. Tel: +60 520 850 00,
E-mail: mazfai@yahoo.com

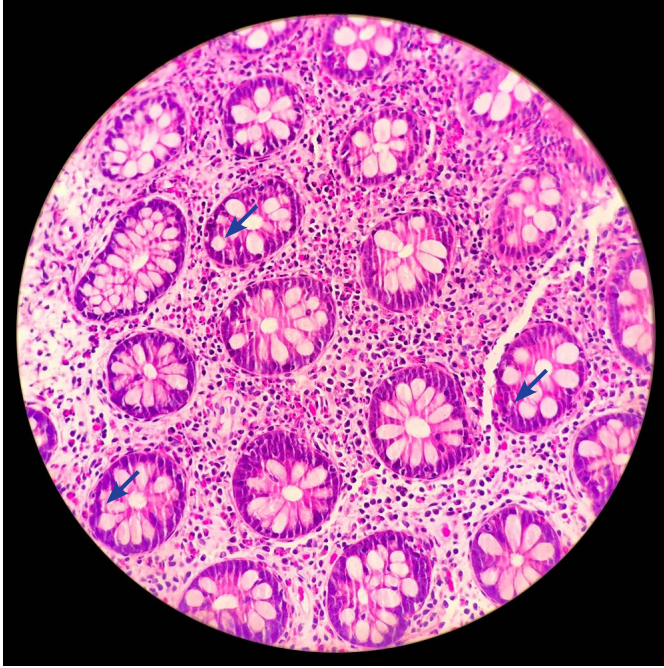


FIGURE 1. Eosinophilic cryptitis (pointed with the blue arrows)

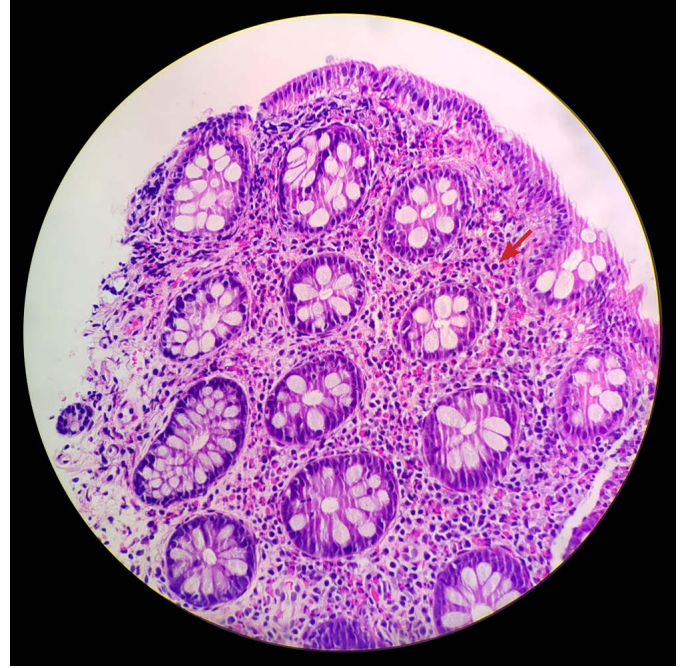


FIGURE 2. Abundant eosinophils in lamina propria (pointed with the red arrow)

included perindopril 4 mg once daily, dabigatran 150 mg twice daily, atorvastatin 40 mg nocte, and levatiracetam 500 mg twice daily. His mother was diagnosed with colon cancer at the age of 75. Other aspects of clinical history and physical examination were unremarkable.

The complete blood count showed isolated peripheral eosinophilia with an absolute eosinophil count of $6.84 \times 10^3/\mu\text{L}$ (normal range: $0.02\text{--}0.5 \times 10^3/\mu\text{L}$). Other blood parameters (renal profile, liver function test, thyroid function test, C-reactive protein, and erythrocyte sedimentation rate) were within normal range. Stool bacterial culture and microscopic parasitology examination were negative for pathogens.

In view of his advanced age, no previous endoscopic colorectal cancer screening, and family history of colonic malignancy, a decision was made to perform esophagogastroduodenoscopy (EGD) and colonoscopy on day 7 from symptom onset. The EGD showed antral erythematous gastritis with negative rapid urease test, whereas colonoscopy revealed a histologically confirmed Paris classification 0-Is, Narrow Band Imaging International Colorectal Endoscopic (NICE) Type 1 sigmoid hyperplastic polyp measuring 0.3 cm, which was completely resected by cold snaring. The rest of the colonoscopy examination revealed a normal aspect from the rectum to the terminal ileum. Histopathological examination of random segmental colonic biopsies from the cecum and ascending colon showed mucosal lymphoplasmacytic cell infiltration with increased

eosinophil count of 100–130 cells/high power field (HPF) associated with occasional eosinophilic cryptitis (Figure 1 and Figure 2). No eosinophilic crypt abscesses, granulomas, or infective organisms were seen. Other colonic segments and the terminal ileum were histologically normal.

The patient's symptoms resolved spontaneously eight days after the first dose vaccination without any treatment. He received the second dose of BNT162b2 vaccine 21 days after the first dose without reporting any symptomatic adverse reaction. His absolute eosinophil count has subsequently normalized after 34 days from the first dose of vaccination.

DISCUSSION

Diarrhea as a post-vaccination adverse event was not reported in the initial clinical trial. There were also no reports on eosinophilia or eosinophilic colitis (EC) post-vaccination.² However, diarrhea was reported as an adverse event in 8.2% of patients receiving the BNT162b2 vaccine outside of clinical trials.²

Peripheral eosinophil counts are usually elevated in patients with EC but might be normal in approximately 20% of patients.³ The percentage of peripheral eosinophils among leucocytes can range from 5% to 35%, with an average peripheral blood eosinophil count of $1,000/\mu\text{L}$.⁴ Allergy is one of the proposed mechanisms of pathogenesis in EC, which could be possible in this patient.^{3,5,6}

Eosinophils can be present in normal physiologic states throughout the gastrointestinal tract. The diagnosis of mucosal EC is established by the presence of a higher number of eosinophils than expected on microscopic examination of biopsies of the gastrointestinal tract.^{3,7-9} As there is no defined cut-off value for the number of eosinophils per HPF to diagnose EC, the diagnosis should be confirmed by an experienced gastrointestinal histopathologist to assess if the eosinophil count is greater than expected for a particular area. The suggested normal upper limit of eosinophil count for the right colon is 100 per HPF.¹⁰

CONCLUSIONS

We are reporting a case of EC, with post-BNT162b2 vaccination as a putative cause. The symptoms were self-limiting, and no specific treatment was required. The patient did not develop recurrence or worsening of symptoms after the second dose of vaccination. This novel vaccine utilizes a mechanism of action not previously seen in other vaccines, and as such, more data and research is needed to confirm EC as a possible adverse reaction. Clinicians should be vigilant about the possibility of EC in the event of post-vaccination diarrhea and report it accordingly.

CONFLICT OF INTEREST

Nothing to declare.

REFERENCES

1. World Health Organization. Draft landscape of COVID-19 candidate vaccines. <https://www.who.int/publications/m/item/draft-landscape-of-covid-19-candidate-vaccines> (20 October 2020).
2. Pfizer-BioNTech COVID-19 Vaccine EUA Fact Sheet for Healthcare Providers Administering Vaccine, revised 25 June 2021
3. Talley NJ, Shorter RG, Phillips SF, Zinsmeister AR. Eosinophilic gastroenteritis: a clinicopathological study of patients with disease of the mucosa, muscle layer, and subserosal tissues. *Gut*. 1990;31:54-58.
4. Chang JY, Choung RS, Lee RM, et al. A shift in the clinical spectrum of eosinophilic gastroenteritis toward the mucosal disease type. *Clin Gastroenterol Hepatol*. 2010;8:669-675.
5. Yun MY, Cho YU, Park IS, et al. Eosinophilic gastroenteritis presenting as small bowel obstruction: a case report and review of the literature. *World J Gastroenterol*. 2007;13:1758-1760.
6. Caldwell JH, Tennenbaum JI, Bronstein HA. Serum IgE in eosinophilic gastroenteritis. Response to intestinal challenge in two cases. *N Engl J Med*. 1975;292:1388-1390.
7. Katz AJ, Goldman H, Grand RJ. Gastric mucosal biopsy in eosinophilic (allergic) gastroenteritis. *Gastroenterology*. 1977;73:705-709.
8. Lee CM, Changchien CS, Chen PC, et al. Eosinophilic gastroenteritis: 10 years experience. *Am J Gastroenterol*. 1993;88:70-74.
9. Lee M, Hodges WG, Huggins TL, Lee EL. Eosinophilic gastroenteritis. *South Med J*. 1996;89:189-194.
10. Collins MH. Histopathologic features of eosinophilic esophagitis and eosinophilic gastrointestinal diseases. *Gastroenterol Clin North Am*. 2014;43:257-268.