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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Letter to Editor

Breakthrough COVID-19 case after full-dose administration of CoronaVac vaccine

Dear Editor:

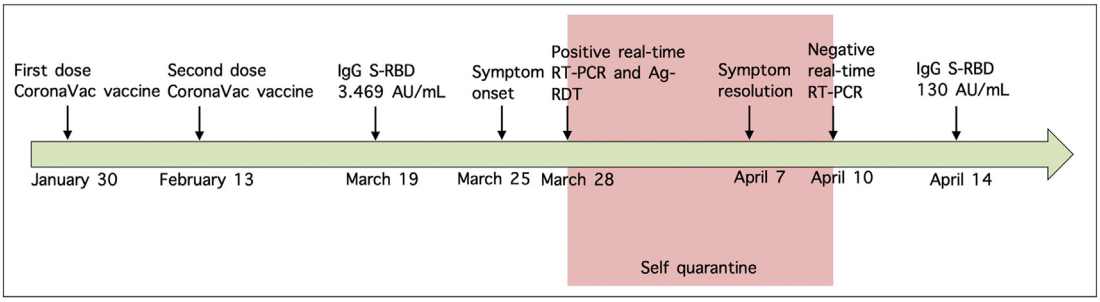

Fig. 1. Timeline of vaccine schedule, symptoms onset, COVID-19 diagnosis, and antibody measurement.

With the apparent discrepant results of CoronaVac efficacy (50.7–83.5%) [1] and the emergence of novel viral variants [2], concern regarding the incidence of breakthrough infections is inevitable. Here, we describe a fully vaccinated person in whom subsequent breakthrough infection was observed. The 41-year-old female healthcare worker received the first dose of CoronaVac vaccine on January 30, 2021, and the second dose on February 13. On March 19, the antibody (SARS-CoV-2 S-RBD IgG, cut-off $\geq$ 1.0AU/mL; Snibe Diagnostics; Fig. 1) was measured, yielding a concentration of 3.469 AU/mL. Six days later, a sore throat, cough, congestion, and loss of taste and smell developed. She tested positive for both SARS-CoV-2 antigen and RNA on March 28, despite having followed routine precautions. During 14 days self-isolation, her symptoms gradually resolved over a 10-day period. On April 10, she tested negative for SARS-CoV-2 RNA. Four days later, the level of antibody was re-assessed, resulting a concentration of 130 AU/mL.

In this patient, COVID-19 symptoms was developed 40 days post-vaccination. Considering the time course and antibody titer, it is likely that patients had a limited amount of humoral immune response to the vaccine, despite no history of immunodeficiency disorders. Additionally, antibody level in this patient was much lower than those who previously had COVID-19 [3]. Interestingly, high titer of the antibody was present 20 days after the development of symptoms. Recently, breakthrough infections were also reported following Pfizer–BioNTech/Moderna vaccination, despite evidence of effective immune response among the breakthough subjects [2]. In these reports, the sequencing result of the breakthrough infections involved variants of concern such as E484K, T951, del142-144, and DG14G.

Altogether, these observations suggest two possible mechanisms responsible for breakthrough infections, lack of immune response elicited by the vaccine and a subsequent infection with the variant virus. Whether or not novel variants play a part in the risk of post-vaccination remains unclear, and so it is important in this current state to perform viral DNA sequencing from patients with breakthrough infections.

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Declaration of competing interest

None.

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