

# Antibody response after booster vaccination after SARS-CoV-2 breakthrough infections in patients with advanced cancer

Volume 10 Issue 2 - 2023

Attapon Cheepsattayakorn,<sup>1,2</sup>  
Ruangrong Cheepsattayakorn,<sup>3</sup> Porntep  
Siriwanarangsun<sup>1</sup>

<sup>1</sup>Faculty of Medicine, Western University, Thailand

<sup>2</sup>10<sup>th</sup> Zonal Tuberculosis and Chest Disease Center, Thailand

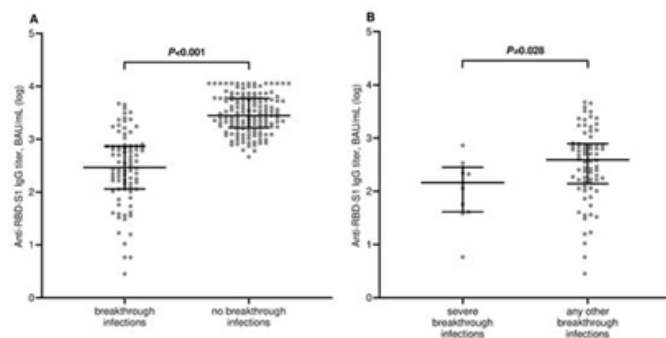
<sup>3</sup>Department of Pathology, Faculty of Medicine, Chiang Mai University, Thailand

**Correspondence:** Attapon Cheepsattayakorn, 10<sup>th</sup> Zonal Tuberculosis and Chest Disease Center, 143 Sridornchai Road Changklan Muang Chiang Mai 50100 Thailand, Tel 66 53 140767, 66 53 276364, Fax 66 53 140773, 66 53 273590, Email Attapon1958@gmail.com

**Received:** August 28, 2023 | **Published:** August 28, 2023

## Editorial

Even after triple COVID-19 vaccination, several population-based studies have demonstrated that patients with cancer continue to be at an increased risk of COVID-19 infections, depending on specific cancer types and different active therapies.<sup>1</sup> Higher cumulative risk was identified in vaccinated patients with lung, colorectal, liver, and pancreatic cancer, whereas lower risk was seen in vaccinated patients with prostate, breast, and gynecological cancer.<sup>1</sup> Data from several retrospective studies confirmed the improvement the short-term clinical outcomes by decreasing hospitalization and 30-day mortality among patients with cancer.<sup>2,3</sup> Additionally, regularity-of-antineoplastic-therapeutics disruption can be caused by mild COVID-19 infection<sup>4</sup> that is similar to hematological malignancies.<sup>5</sup> A recent study revealed that antibody titers higher than 800 binding antibody unit (BAU) were efficiently correlated to SARS-CoV-2-variant-infection-immunological protection and severe symptomatic COVID-19 (Figure 1, 2).<sup>6</sup>



**Figure 1** Demonstrating the comparison of scatter plot distributions and medians of antibody titers.

(A) Comparison of antibody titers between breakthrough infection cases and non-cases.

(B) Comparison of antibody titers between severe breakthrough infection cases and any other cases. RBD-S1, receptor-binding domain (RBD) of the SARS-CoV-2 Spike protein (SI); binding antibody unit (BAU); log, logarithmic values. Bars represent median values with a 95% confidence interval (CI).<sup>6</sup>

## Conclusion

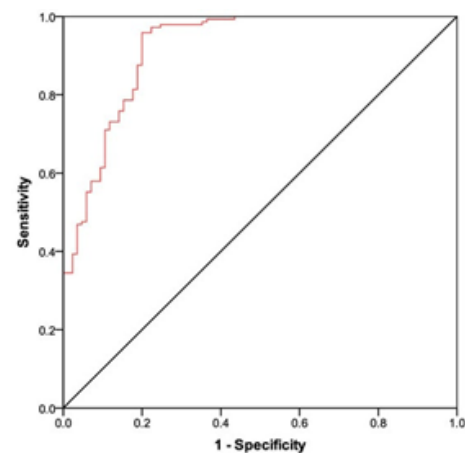
In conclusion, in patients with advanced cancer, active treatment should be prioritized, whereas after COVID-19 third dose will enhance humoral antibody response to protect against COVID-19 breakthrough infections.

## Acknowledgments

None.

## Funding

None.



**Figure 2** Demonstrating the ROC curve analysis of anti-RBD-S1 IgG titers on the SARS-CoV-2 breakthrough infections AUC relative value: 0.92 (95% confidence interval (CI) 0.88–0.95),  $p < 0.001$ , receiver operating characteristic (ROC); RBD-S1, receptor-binding domain (RBD) of the SARS-CoV-2 Spike protein (SI); area under the curve (AUC).<sup>6</sup>

## Conflicts of interests

Author declares that there is no conflict of interest.

## References

- Lee LYW, Ionescu MC, Starkey T, et al. UK coronavirus cancer programme. COVID-19: third dose booster vaccine effectiveness against breakthrough coronavirus infection, hospitalizations and death in patients with cancer: a population-based study. *Eur J Cancer*. 2022;175:1–10.
- Choueiri TK, Labaki C, Bakouny Z, et al. Breakthrough SARS-CoV-2 infections among patients with cancer following two and three doses

- of COVID-19 mRNA vaccines: a retrospective observation study from the COVID-19 and cancer consortium. *Lancet Reg Health Am.* 2023;19:100445.
3. Gong IY, Vijenthira A, Powis M, et al. Association of COVID-19 vaccination with breakthrough infections and complications in patients with cancer. *JAMA Oncol.* 2023;9(3):386–394.
  4. van Vliet ED, Eijkelboom AH, van Giessen A, et al. Physical and mental health outcomes of COVID-19 induced delay in oncological care: a systematic review. *Front Oncol.* 2023;13:998940.
  5. Booth S, Curley HM, Varnai C, et al. Key findings from the UKCCMP cohort of 877 patients with haematological malignancy and COVID-19: disease control as an important factor relative to recent chemotherapy or anti-CD20 therapy. *Br J Haematol.* 2022;196(4):892–901.
  6. Nelli F, Fabbri A, Virtuoso A, et al. Effects of antibody response after booster vaccination on SARS-CoV-2 breakthrough infections and disease outcomes in advanced cancer patients: a prospective analysis of the vax-on-third study. *Curr Oncol.* 2023;30:5103–5115.