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Journal of Science and Medicine in Sport

## Letter to the Editor

**Comment on “Vaccine, infection, COVID-19-related loss of training time and athletes”**

Dear Editor,

We would like to share ideas on the publication “Vaccine versus infection - COVID-19-related loss of training time in elite athletes.”<sup>1</sup> According to Krzywanski et al., COVID-19 causes athletes to lose a large amount of training days, however vaccination against COVID-19 results in a noticeably lesser and more predictable loss.<sup>1</sup> This supports the inclusion of vaccination in prevention plans for athletes whenever they are accessible, according to Krzywanski et al.<sup>1</sup> However, there are additional factors that must be considered for a proper interpretation of their results.

There are 4 points which should be addressed by the authors of the Krzywanski article somewhat better. The efficacy of the utilized vaccines for the acquisition of Covid-19 for given strain of SARS-CoV-2, the recipient's pre-vaccination co-morbidity (which will not, of course, be high in athletes), and their potential impact on adverse reactions and time lost due to vaccination are relevant things to consider. Also, an individual's typical response or other confounding factors could have caused the unpleasant response to the vaccination. The current study by Krzywanski et al. used a questionnaire as well as a retrospective analysis. However, it remains unclear if these data are independent from each other.

The second point is that athletes may have previously had COVID-19 without experiencing any symptoms (which may have an effect on the vaccination side effects and time loss). Prior asymptomatic COVID-19 and the absence of clinical symptoms after vaccination may be linked.<sup>2</sup> For athletes, a chance of prior asymptomatic COVID-19 exists. In a recent study from China, 30.6% of the infected athletes were asymptomatic.<sup>3</sup> An earlier asymptomatic infection can result in altered symptoms of COVID-19 or a different response to COVID-19 vaccine. Therefore, an asymptomatic previous COVID-19 must be checked out. Krzywanski et al. used no laboratory tests to rule out a previous asymptomatic COVID-19. As a result, such a confounding effect may exist in this case and may have affected their observation. This would potentially cause more variability.

The third problem that needs to be addressed is “cross contamination” with COVID-19, or the presence of an unidentified COVID-19 at the time of vaccination (with potential side effects and impacts on time loss). A breakthrough COVID-19 is still possible after immunization. According to a recent report, the COVID-19 breakthrough can occur as early as the first day after immunization, implying an unfortunate timepoint of vaccination.<sup>4</sup> Again, no examination has been conducted in the Krzywanski et al. study to rule out the likelihood of cross contamination as a confounding factor.

The fourth and last factor to be considered is the genetic background, which may also affect how an individual responds to immunization. Čiučiulkaitė et al.<sup>5</sup> investigated the idea that inherited genetic variability influences vaccination recipients' immunological response. The GNB3

gene c.825C>T polymorphism has been observed to be related with a response to the COVID-19 vaccine.<sup>5</sup> If future clinical trials are planned that address vaccine efficacy and side effects, the impacts of the genetic polymorphism background should be taken into account. Gülyaşar et al. reported that similar healthy athletes had diverse backgrounds of the GNB3 gene c.825C>T polymorphism, which is connected with physical fitness.<sup>6</sup> Unfortunately, there is no assessment of the genetic background in Krzywanski et al.'s.

The mentioned confounders may have influenced the results and induced more variability. If there is a confounder, there might be a variable low or high clinical efficacy of the vaccine. The observed outcomes might be incorrectly interpreted. To measure the COVID-19-related loss of training time in elite athletes, a robust approach should be in place to rule out confounding effects such as prior COVID-19 infection, cross contamination, and co-morbidity. In addition, the participants must be divided into groups depending on the utilized vaccine type, vaccination delivery technique, and dosage. If additional research is conducted with a plan to manage these points, it may provide more important data for future planning to manage the COVID-19 problem and post-COVID-19 consequences among athletes.

**Conflict of interest**

None.

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Rujittika Mungmunpantipantip  
Private Academic Consultant, Thailand  
Corresponding author.  
E-mail address: [rujittika@gmail.com](mailto:rujittika@gmail.com).

Viroj Wiwanitkit  
Adjunct professor, University Centre for Research & Development Department  
of Pharmaceutical Sciences, Chandigarh University Gharuan, India

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