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Could fractional mRNA COVID-19 vaccines reduce myocarditis in adolescents?

To the Editor

Vaccination against COVID-19 has rapidly tuned into a global practice. Among the hundreds of millions of vaccine doses administered, there has been growing attention on the rare reports of cardiac affections – namely myocarditis and pericarditis – following immunization with mRNA COVID-19 vaccines [1]. According to the UD Centers for Disease Control and Prevention, inflammation of heart muscle or outer lining has been mostly described in adolescent male and more often after getting the second dose of the two mRNA COVID-19 vaccines [2].

Even a direct causal relationship is yet to be described, this rare complication must be considered in view of the increasing extensive global use of mRNA COVID-19 vaccines in adolescents and younger groups, enhancing safety and tolerability of those vaccines, and preventing the vaccine hesitancy from worsening.

In this context, next steps in global efforts to improve the safety of and adherence to COVID-19 vaccines should include personalized vaccinology approaches, at least at group level. In the last days, media announced that phase 2 and 3 trials with lower mRNA vaccine doses are ongoing in pediatric populations. Similarly, adolescents could take advantage of dose escalation and adjustment, even outside of any protocol-specified dose, particularly for the booster dose, which seems to cause more myocarditis and pericarditis cases than the prime administration.

Rationales for this hypothesis exist. The same strategy has been previously applied in other vaccination campaigns [3]. Furthermore, taking as reference the dose-finding study of BNT162b2 mRNA vaccines safety and immunogenicity, it was expected a vaccine induced humoral response already from a 1- to 5 µg dose, even if a 3- to 10-fold higher dose was found to elicit stronger antibody responses [4].

In conclusion, we wish here to suggest the possible use of fractionated doses in adolescents and foster further investigations to find the most appropriate vaccine dosage that can protect from COVID-19 severe

outcomes, balancing safety and reactogenicity.

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Declaration of competing interest

Nothing to disclose.

References

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