CORRESPONDENCE

In response to Detection of SARS-CoV-2 IgA and IgG in human milk and breastfeeding infant stool 6 months after maternal COVID-19 vaccination

Journal of Perinatology (2023) 43:827; https://doi.org/10.1038/s41372-023-01669-6

TO THE EDITOR:

Secretion of neutralizing SARS-CoV-2 IgA and IgG in human milk after vaccination against COVID-19 is well established [1]. Little however is known so far about IgA and IgG transfer from milk to breastfeeding infants and its clinical relevance. A recent paper published in this Journal [2] addresses the issue by investigating SARS-CoV-2 IgA and IgG, and their SARS-CoV-2 neutralization capacities, in maternal milk and plasma before and after COVID-19 vaccination, as well as in infants' stool [2]. Based on their data, the authors conclude that SARS-CoV-2-specific IgA and IgG levels and SARS-CoV-2 neutralization capacity are higher in infant stool post-maternal vaccination amongst milk-fed compared to controls. Careful examination of reported results leads however to different conclusions.

Figure 1 of the paper [2] clearly shows that stool neutralization capacity and IgA levels are not different between infants milk-fed by vaccinated mothers in comparison to controls, as also indicated by the reported *P* values of respectively 0.8 and 0.08, the latter likely due to a single outlier value in the group of infants milk-fed by vaccinated mothers. The difference in IgG levels, although statistically significant, is due just to a minor subgroup of subjects with slightly higher values among infants milk-fed by vaccinated mothers, while the majority of values are in the very same range in infants milk-fed by vaccinated mothers and in controls. The correlation between infant stool IgG and maternal plasma and milk IgG (Supplementary Table 2) obtained from 19 different analyses should be re-examined after adjustments for multiple comparisons.

In summary, study data clearly do not support any presence of specific SARS-CoV-2 antibodies in breastfeeding infants' stool nor any improvement in infants' stool SARS-CoV-2-specific neutralization capacity following maternal SARS-CoV-2 vaccination, as stated instead in the discussion [2], except possibly for the small subgroup of infants with high stool IgG levels, which however is unclear to what extent might result in any neutralization capacity.

As a whole, data presentation and interpretation are affected by irremediable mistakes, which misrepresent the consequences of maternal COVID-19 vaccination for milk-fed infants. This is even more important in light of available evidence showing the occurrence of vaccine-derived SARS-CoV-2 Spike (S) protein mRNA in the milk of women after the administration of COVID-19 vaccines [3, 4]. Increasing evidence points to a major contribution of vaccination-induced excessive production of S protein (and possibly of the vaccine RNA itself) in adverse effects following vaccination (reviewed in [5, 6]); thus, unintended exposure of infants to vaccine RNA and/or to the resulting S protein is at present a matter of concern. Remarkably, reports exist showing that some infants milk-fed by COVID-19-vaccinated women experience fever early after maternal vaccination [7]. Whether fever is a consequence of exposure to vaccine RNA and/or to the S protein remains to be established; however, the possibility should not be ignored in view of its critical importance for the safety assessment of COVID-19 vaccinations in breastfeeding women.

Marco Cosentino[1]✉ and Franca Marino[1]
[1]*Center for Research in Medical Pharmacology, University of Insubria, Varese, Italy.* ✉*email: marco.cosentino@uninsubria.it*

REFERENCES

1. Whited N, Cervantes J. Antibodies against SARS-CoV-2 in human breast milk after vaccination: a systematic review and meta-analysis. Breastfeed Med. 2022;17:475–83.
2. Stafford LS, Valcarce V, Henry M, Neu J, Parker L, Mueller M, et al. Detection of SARS-CoV-2 IgA and IgG in human milk and breastfeeding infant stool 6 months after maternal COVID-19 vaccination. J Perinatol. 2023; https://doi.org/10.1038/s41372-022-01581-5.
3. Yeo KT, Chia WN, Tan CW, Ong C, Yeo JG, Zhang J, et al. Neutralizing activity and SARS-CoV-2 vaccine mRNA persistence in serum and breastmilk after BNT162b2 vaccination in lactating women. Front Immunol. 2022;12:783975.
4. Hanna N, Heffes-Doon A, Lin X, Manzano De Mejia C, Botros B, Gurzenda E, et al. Detection of messenger RNA COVID-19 vaccines in human breast milk. JAMA Pediatr. 2022;176:1268–70.
5. Cosentino M, Marino F. Understanding the pharmacology of COVID-19 mRNA vaccines: playing dice with the spike? Int J Mol Sci. 2022;23:10881.
6. Trougakos IP, Terpos E, Alexopoulos H, Politou M, Paraskevis D, Scorilas A, et al. Adverse effects of COVID-19 mRNA vaccines: the spike hypothesis. Trends Mol Med. 2022;28:542–54.
7. Perl SH, Uzan-Yulzari A, Klainer H, Asiskovich L, Youngster M, Rinott E, et al. SARS-CoV-2-specific antibodies in breast milk after COVID-19 vaccination of breastfeeding women. JAMA. 2021;325:2013–4.

AUTHOR CONTRIBUTIONS

MC and FM contributed equally to the conception and drafting of the manuscript, which they unanimously approved in its final version and for whose integrity they assume full responsibility.

COMPETING INTERESTS

The authors declare no competing interests.

ADDITIONAL INFORMATION

Correspondence and requests for materials should be addressed to Marco Cosentino.

Reprints and permission information is available at http://www.nature.com/reprints

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Received: 14 January 2023 Revised: 24 March 2023 Accepted: 28 March 2023
Published online: 25 April 2023