

OBJECTIVE

The study aimed to describe and compare neonatal **antibody response following COVID-19 vaccination** in patients **with or without history of COVID-19 infection** during pregnancy. Comparison between the two groups was also done in terms of maternal outcomes, neonatal outcomes, timing of vaccination, and type of vaccine.

DESIGN

There is limited data concerning COVID-19 immunogenicity of pregnant patients and their neonates. This was a pilot prospective cohort study on patients who delivered in a **Philippine tertiary hospital** from **February 1 to July 31, 2022**.

METHODOLOGY

The study was conducted on 144 obstetric patients aged 18-45. Study participants were divided into (1) vaccinated-only and (2) vaccinated with history of COVID-19 infection during pregnancy. Maternal blood samples were taken on admission while neonatal cord blood was collected post-partum. A **quantitative chemiluminescent immunoassay (VITROS® Anti-SARS-CoV-2 IgG Quantitative Test by Ortho-Clinical Diagnostics, Inc.)** was used to detect SARS-CoV-2 IgG.

RESULTS

All maternal antibody levels yielded presence of significant antibodies. Antibody levels were measured in 89 neonates in the vaccinated-only group and 55 neonates in the vaccinated with history of COVID-19 infection, with 99.3 % and 100% of samples yielding positive antibodies respectively. **Every unit increase in maternal IgG had a 0.75 unit increase in neonatal IgG ($r=0.75$; 95% CI 0.62–0.88; $p<0.001$).** There was no statistical difference in neonatal antibody response in those who were vaccinated-only and those who were vaccinated and contracted COVID-19 during pregnancy (p value=0.576). There was no difference in maternal and neonatal outcomes between the two groups.

Age of gestation (AOG) on second dose ($p=0.047$), AOG on booster ($p=0.003$), and AOG on latest vaccination ($p<0.001$) had positive association with neonatal IgG levels. **Latency from latest vaccination/booster ($p=0.028$)** had a negative association with neonatal IgG. A day increase in latency yielded a decrease of 0.18 units and 0.38 units for neonatal and maternal IgG values, respectively. **Vaccination during the third trimester** recorded the highest median neonatal IgG ($p=0.026$).

BNT162b2 (Pfizer) yielded the highest median IgG for primary vaccine while **MRNA-1273 (Moderna)** yielded the highest median IgG for booster.

CONCLUSION

COVID-19 infection did not significantly increase neonatal antibody response compared to those with no COVID-19 exposure. History of COVID-19 infection did not influence maternal and neonatal outcomes. Maternal vaccination during the third trimester yielded highest neonatal antibody response. This study may aid healthcare professionals in COVID-19 vaccination timing and administration as vaccination during the third trimester confers greatest immunogenicity for neonates.

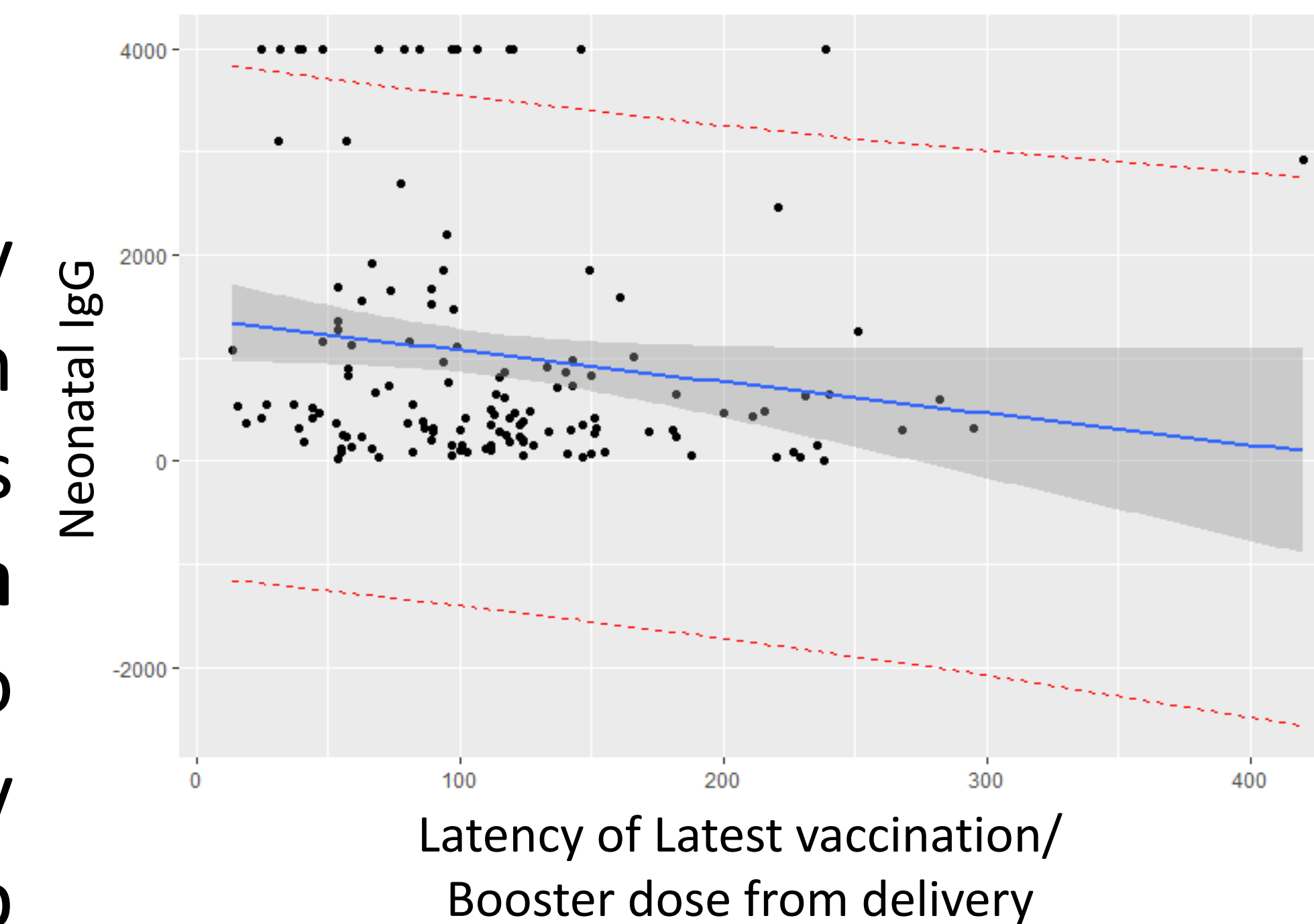


Figure 1. The relationship of Latency (time of latest vaccination/ booster) and levels of Neonatal IgG

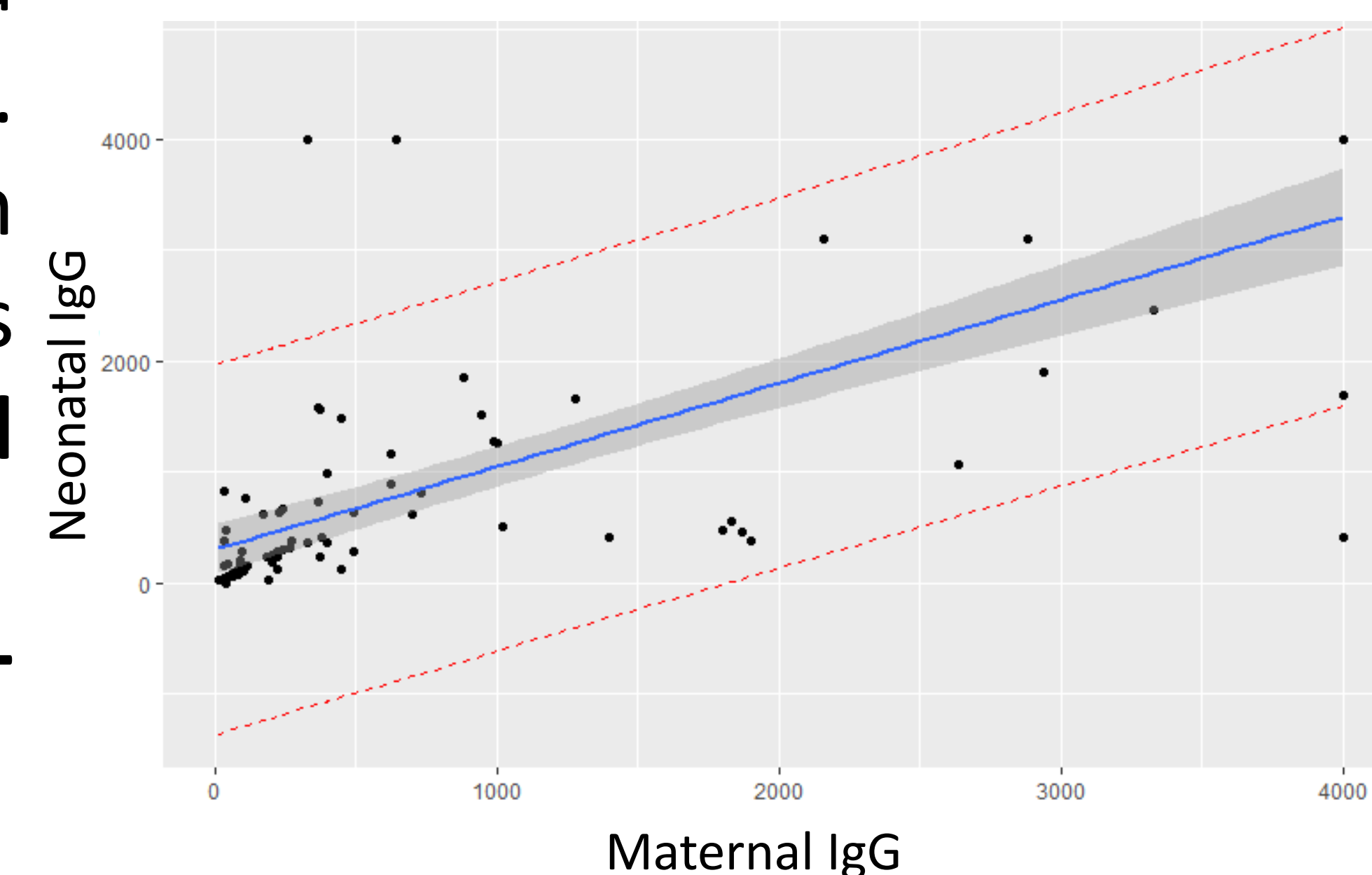


Figure 2. The relationship of Maternal and Neonatal IgG levels