P.19 Exploring the Interplay Between Covid-19 Vaccination, Red Blood Cells, and Immune Function

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Red blood cells (RBCs) are increasingly acknowledged as crucial contributors to the innate immune response, particularly through their interactions with inflammatory molecules such as cytokines/chemokines [1], nucleic acids , and pathogens, which help regulate immune responses [2].

Following COVID-19 vaccination at different time-points, before and after 1st or 2nd vaccine dose (t0-t4), RBCs and their derivatives (RBCc and RBC-conditioned media (CM) after 48-72h of culture) showed significant alterations in their cytokine profile, particularly in proinflammatory cytokines (IL-1β, IL-6, IL-12. IL-15, TNF-α, IFN-γ) at time-points, specially just after vaccination (t1,t3) . These cells also exhibited higher concentrations of these molecules compared to plasma, as previously noted in other studies. Moreover, the activity of peripheral blood mononuclear cells (PBMCs) in cell culture was affected by the presence of RBC samples collected before (t0) and after vaccination (t1), leading to increased secretion of proinflammatory cytokines (IL-12, TNF-α, IFN-γ) in response. Results also suggested that RBCs may contain other factors or molecules apart from cytokines that act as immunomodulators, which may influence PBMC activity and thus the immune response to vaccination.

These findings have the potential to impact clinical diagnostics, therapeutic strategies, and our understanding of immune regulation.

References

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