VAC_06 - The cellular response elicited by ChAdOx1 nCoV-19 (Astrazeneca) vaccine in a cohort from Rio de Janeiro, Brazil with or without previous SARS-CoV-2 infection

Tamiris Azamor da Costa Barros[1]; Danielle Regina de Almeida de Brito e Cunha[1]; Juliana Gil Melgaço[1]; Luciana Neves Tubarão[1]; Jane da Silva[1]; Ana Beatriz Teixeira Frederico[1]; Bruno Pimenta Setatino[1]; Ingrid Siciliano Horbach[1]; Nathalia dos Santos Alves[1]; Sheila Maria Barbosa de Lima[1].
[1]Fiocruz/Bio-Manguinhos.

Introduction: The infection caused by the new coronavirus (SARS-CoV-2) induces a severe acute respiratory syndrome called COVID-19, leading to more than six million deaths worldwide. The ChAdOx1 nCoV-19 vaccine developed by AstraZeneca and produced by Bio-Manguinhos helps to drop mortality in Brazil and many other countries. Cellular immunology is a key aspect of overall vaccine-induced immunological memory. Additionally, lymphocyte response reflected in interferon and pro-inflammatory cytokine production are presented in the COVID-19, triggering memory protective responses.

Objective: To assess the profile of cellular responses elicited by the ChAdOx1 nCoV-19 vaccine considering participants with or without previous SARS-Cov-2 infection.

Methodology: Blood samples obtained from participants vaccinated with ChAdOx1 nCoV-19 were collected in a follow-up strategy: 0, 7, 15, 30, 90, and 120 days after vaccination (DAV) with first dose, with a second dose at 90 DAV. Participants tested every two weeks were clustered according to any previous SARS-Cov-2 PCR positive result (COVID-19) or otherwise (noCOVID-19). The number of IFN-γ produced cells was assessed by ELISpot and levels of IL-10, IFNL3/IL-28B, and D-Dimers were quantified in plasma by Luminex technology.

Results: Considering the complete cohort the number of cells producing IFN-γ presented enhanced levels 15DAV and 120DAV. Clustering participants according to the previous infection at 15DAV noCOVID-19 presented augmented levels, without differences before (0DAV) or after complete vaccination (120DAV). Luminex analyses do not present significant differences either considering vaccination follow-up, or previous infection.

Conclusion: It remains elusive the cutoffs for protective memory cellular responses to achieve disease protection. Although, our results demonstrated that ChAdOx1 nCoV-19 elicits IFN-γ cellular responses both after the first and second dose, without pro-inflammatory or prothrombotic responses. Besides, here it was observed that previous SARS-Cov-2 infection modulates cellular response kinetics, presenting a faster IFN-γ production, which does not reflect on the positive final responses after complete vaccination.

Keywords: Cellular response; Vaccine; SARS-CoV-2; ChAdOx-nCoV-19