Mucosal response of Inactivated and Recombinant COVID-19 vaccines in Congolese individuals

Freisnel Mouzinga[1], Constanze Heinzel[2], Abel Lissom[3], Andrea Kreidenweiss[2], Armel Batchi-Bouyou[1], Jacques Dollon Ntadi[1], Jean Claude Djontu[1], Etienne Nguimbi[4], Peter Kremsner[2], Rolf Fendel[2], and Francine NTOUMI[1]

[1]Fondation Congolaise pour la recherche medicale
[2]University of Tübingen
[3]Universite de Yaounde I
[4]Marien Ngouabi University Faculty of Science

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Abstract

Background: The efficacy of immunization against an airborne pathogen depends in part on its ability to induce antibodies at the major entry site of the virus, the mucosa. Recent studies have revealed that mucosal immunity is poorly activated after vaccination with mRNA vaccines, thus failing in blocking virus acquisition upon its site of initial exposure. Little information is available about the induction of mucosal immunity by inactivated and recombinant COVID-19 vaccines. This study aims to investigate this topic. Methods: Saliva and plasma samples from 440 healthy Congolese were collected including (1) fully vaccinated two month post vaccination with either an inactivated or a recombinant COVID-19 vaccine and (2) non-vaccinated control group. Total anti-SARS-COV-2 RBD IgG and IgA antibodies were assessed using in-house ELISAs for both specimens. Findings: Altogether, the positivity of IgG was significantly higher in plasma than in saliva samples both in vaccinated and non-vaccinated control groups. Inversely, IgA positivity was slightly higher in saliva than in plasma of vaccinated group. The overall IgG and IgA levels were respectively over 103 and 14 times lower in saliva than in plasma samples. We found a strong positive correlation between IgG in saliva and plasma also between IgA in both specimens (r = 0.70 for IgG and r = 052 for IgA). Interestingly, contrary to IgG, the level of salivary IgA was not different between seropositive control group and seropositive vaccinated group. No significant difference was observed between recombinant and Inactivated COVID-19 vaccines in total IgG and IgA antibody concentration release 2 months post vaccination both in plasma and saliva. Conclusion: Inactivated and recombinant COVID-19 vaccines in use in the Republic of Congo poorly activated mucosal IgA mediated antibody response two months post-vaccination.

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