ChAdOx1 nCoV-19 Vaccination Prevents SARS-CoV-2 Pneumonia in Rhesus Macaques

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Abstract

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) emerged in December 2019[1,2] and is responsible for the COVID-19 pandemic[3]. Vaccines are an essential counter-measure urgently needed to control the pandemic[4]. Here, we show that the adenovirus-vectored vaccine ChAdOx1 nCoV-19, encoding the spike protein of SARS-CoV-2, is immunogenic in mice, eliciting a robust humoral and cell-mediated response. This response was not Th2 dominated, as demonstrated by IgG subclass and cytokine expression profiling. A single vaccination with ChAdOx1 nCoV-19 induced a humoral and cellular immune response in rhesus macaques. We observed a significantly reduced viral load in bronchoalveolar lavage fluid and respiratory tract tissue of vaccinated animals challenged with SARS-CoV-2 compared with control animals, and no pneumonia was observed in vaccinated rhesus macaques. Importantly, no evidence of immune-enhanced disease following viral challenge in vaccinated animals was observed. ChAdOx1 nCoV-19 is currently under investigation in a phase I clinical trial. Safety, immunogenicity and efficacy against symptomatic PCR-positive COVID-19 disease will now be assessed in randomised controlled human clinical trials.

Competing Interest Statement

SCG is a board member of Vaccitech and named as an inventor on a patent covering use of ChAdOx1-vectored vaccines and a patent application covering a SARS-CoV-2 (nCoV-19) vaccine. Teresa Lambe is named as an inventor on a patent application covering a SARS-CoV-2 (nCoV-19) vaccine. The remaining authors declare no competing interests.

Link

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