Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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might not be an optimal choice. ChAdOx1-S was shown to induce less virus-specific immune responses than the mRNA-based vaccines. Additionally, the usefulness of VLA2001 in the current phase of the pandemic remains to be determined through critical studies with VLA2001 in the intended target populations, thereby defining its position in the landscape of available vaccines.

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Time to redefine a primary vaccination series?

In the third year of the COVID-19 pandemic, it is getting harder to define what a full-dose COVID-19 vaccination series is, especially in the era of emerging variants such as omicron (B.1.1.529). The definition might differ depending on the dominant variant in circulation, the availability of vaccines, the risk factors of vaccine recipients, and the availability of surveillance and COVID-19 vaccine safety and effectiveness data. Inequitable vaccine availability adds to the problem as on one hand, in many high-income countries, a fourth dose of an mRNA vaccine is offered and gives well tolerated boosting of cellular and humoral immunity, and on the other hand, only 19–7% of people in low-income countries have received at least one dose of any COVID-19 vaccine. These facts all make it difficult to comment on what a primary COVID-19 vaccination series should consist of and how we should boost protective immunity in the face of emerging variants in a world with marked inequalities.

In The Lancet Infectious Diseases, Karin Hardt and colleagues report on the efficacy, safety, and immunogenicity of a second dose of Ad26.COV2.S vaccine against COVID-19 given as part of the ENSEMBLE2 trial, wherein participants were randomly assigned from the first visit either to get two doses of the vaccine or two doses of placebo 2 months apart. The two-dose regimen provided 75.2% (adjusted 95% CI 54.6–87.3) efficacy against moderate to severe–critical COVID-19 and 100% (32.6–100.0) efficacy against severe–critical COVID-19. Meanwhile, the final analysis of the double-blind phase of the ENSEMBLE vaccine trial showed that primary vaccination with a single dose of Ad26.COV2.S had 56.3% (95% CI 51.3–60.8) efficacy against moderate to severe–critical COVID-19, 74.6% (64.7–82.1) efficacy against severe–critical COVID-19, and 82.8% (40.5–96.8) efficacy against COVID-19 related death. The data collection for the primary analyses of one-dose and two-dose regimens was completed before the global dominance of delta (B.1.617.2) and the emergence of omicron.

The follow-on, single-arm, open-label, phase 3b, Sisonke study in health-care workers in South Africa showed that after two doses of Ad26.COV2.S vaccine, effectiveness against severe disease during the omicron surge was equal to that of two doses of BNT162b2. Moreover, a longer interval (4 months) between the two doses of Ad26.COV2.S led to lesser omicron immune escape than other two-dose vaccine regimens (given 3–4 weeks apart). However, vaccinees receiving two doses of Ad26.COV2.S had greater omicron immune escape than vaccinees receiving three doses of mRNA vaccines or three doses of different heterologous regimens. These findings suggest that a third dose of either Ad26.COV2.S or another vaccine
Next-generation malaria subunit vaccines to reduce disease burden in African children

Malaria remains a public health problem, with 241 million malaria cases and 627,000 deaths reported globally by WHO in 2020, 95% of which occurred in sub-Saharan Africa.1 Plasmodium falciparum is the deadliest malaria species in humans, following a life cycle that alternates between an insect vector and the human host. Eukaryotic cells, named sporozoites, are transmitted from female Anopheles mosquitoes into human skin during blood feeding. The sporozoite represents an attractive target in the parasite life cycle for vaccine development. The circumsporozoite surface protein (CSP) is the most abundant protein on the sporozoite surface and has multiple roles in sporozoite biology.2 CSP is composed of a central region of NANP repeats flanked by more conserved N-terminal and C-terminal domains.2

The malaria vaccine development community has focused for many years on how to develop CSP-based vaccines and formulations, and these efforts led to the clinical development of RTS,S, a subunit vaccine encompassing CSP repeats (R) and C-terminal T-cell epitopes (T) recombinantly fused to HBsAg (S). The RTS portion is present in a 1:4 molar ratio with HBsAg alone (S), hence the name RTS,S, which is formulated in adjuvant AS01, containing the immunostimulatory molecules monophosphoryl lipid A and the saponin QS-21. The RTS,S vaccine showed moderate, age-dependent efficacy in a large phase 3 study, but based on the number of clinical cases averted, WHO endorsed RTS,S/AS01 for children living in moderate to high malaria endemic regions.3 The next-generation malaria vaccine R21 consists of a fusion protein of CSP

Comment

We declare no competing interests.

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