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Apical membrane antigen-1 of falciparum malaria parasite (Pf83/Ama1): Efficacy as a malaria vaccine, uncertainties and attempts at improving efficacy

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Apical membrane antigen (called AMA) found in *Plasmodium falciparum* malaria parasite has been one of the leading malaria vaccine candidates and a subject of study for its potentials as an effective vaccine. The burden posed by malaria over the decades, more so in the under developed tropical world, re-emergence of malaria in regions it has been perceived to have once been eradicated, problem posed by resistance to effective drug by the parasite are among other reasons for spirited attempts by researchers to come up with good products from their efforts to support malaria control programs. Most of the discovered and developed vaccines have protected animal models. Immunity in humans seems short-lived, ineffective and results in milder, sometimes asymptomatic infections in spite of the parasites' persistence. It has been suggested that cell and antibody mediated immunities jointly confer the protection observed in animal models and this may have important implications for developing human vaccines. The vital role played by AMA1 during the process of merozoite invasion of red blood cells by the parasite, a key event needed by the parasite to complete its life cycle has been part of the major reasons for considering this antigen for candidacy as a vaccine either as monovalent or polyvalent (some of which have been multi-stage or multi-antigen) AMA1 based or incorporating vaccines. So far, the most successful vaccine candidate to get to the highest level of clinical trials has been the RTS, S/AS02A, the first vaccine to pass through the phase-II clinical trials. The polymorphic nature of AMA1 and some other malaria vaccine candidates such as MSP1 among other issues highlighted in this article have been part of the major problems that appeared to have limited its success in humans, despite successes in certain animal models in clinical trials. Thus, for AMA1 based malaria vaccines, the tasks for the future has been to seek to improve its immunological responses irrespective of the major bio-technical problems inherent in the parasite's features at levels good enough to confer protection in both animals and adult humans and able to translate into efficacy when attempted in children recipients. As man, through vaccine scientists seek to declassify the classified perceived elusive myth that has surrounded successful boding of malaria vaccines for pediatric immunization over the decades, human subjects known to be at highest risks of infection and experiencing clinical diseases may be near breathing sigh of relief in the event of eventual success of the most clinically advanced form of a malaria vaccine, the RTS, S/AS2OA or the other vaccine candidates being actively worked on to support man's fight back against the tiny parasite which has boxed its comparatively much bigger man to a tight corner for scores of decades.

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