

Evidence Update

Malaria Series

Do pre-erythrocytic vaccines prevent malaria illness and infection?

One vaccine (RTS,S) shows promise, but further trials are needed to confirm the benefits. There is not enough evidence to assess the effectiveness of three other pre-erythrocytic vaccines.

Inclusion criteria

Studies:

Randomized controlled trials.

Intervention:

Intervention: vaccines aimed at creating immunity that prevents malaria parasites from invading red blood cells, which would prevent a serious case of malaria. All current vaccines contain antigens from the "pre-erythrocyte" (i.e. before red blood cell) stages of malaria parasites.

Control: placebo or control vaccine or routine antimalarial control measures.

Outcomes:

Primary: malaria illness, new malaria infection.

Secondary: severe malaria, prevalence of parasitaemia, adverse events.

Results

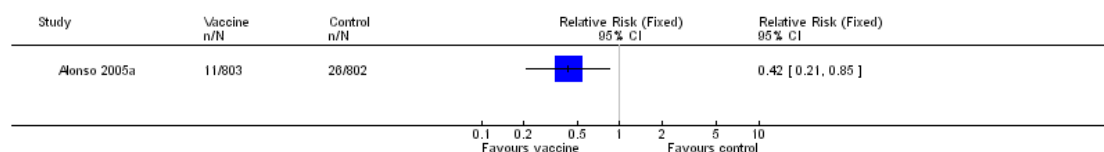
- Nine trials involving over 3,000 participants were included.
- Two trials assessed the RTS,S vaccine in malaria endemic countries. In a trial of children in Mozambique, vaccination reduced severe malaria episodes by 58% (relative risk 0.42 95% confidence interval 0.21 to 0.85; 1,605 participants), and all clinical malaria infections by 26% (RR 0.74 95% CI 0.63 to 0.87). A trial in adults in The Gambia, showed no effect in the first year after vaccination, but participants who received a booster dose had fewer malaria episodes in the second year (RR 0.37, 95% CI 0.17 to 0.82; 158 participants). No serious adverse events were reported in either trial.
- Trials assessing the CS-NANP vaccine found no difference between vaccine and control groups in new malaria infections (307 participants, 3 trials).
- In one small trial assessing the CS102 vaccine, all 14 non-immune participants developed new malaria infections when artificially challenged by infected mosquitoes.
- One trial assessed the ME-TRAP vaccine and found no significant differences between vaccination and control groups in number of new infections or malaria illness (296 participants). No serious adverse events were reported.



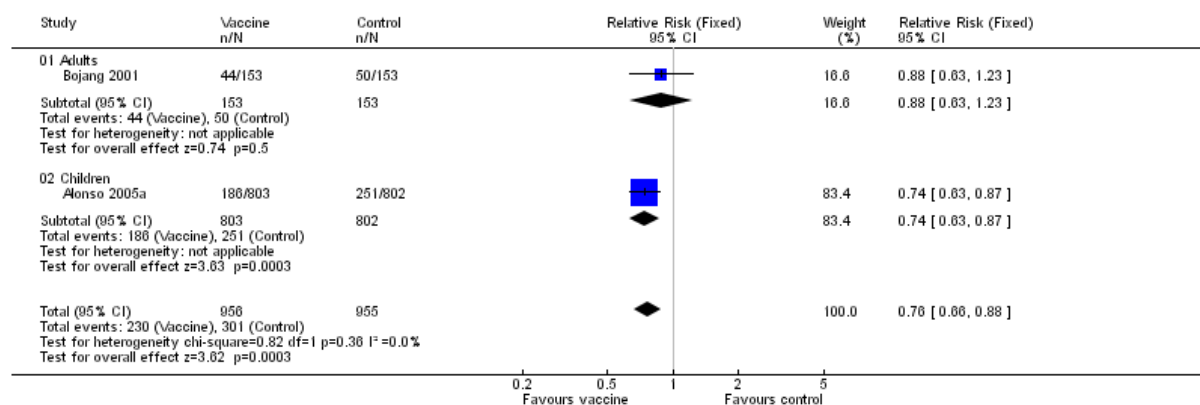
Adapted from Graves P, Gelband H. Vaccines for preventing malaria (pre-erythrocytic). *Cochrane Database of Systematic Reviews* 2006, Issue 4. Art. No.: CD006198. DOI: 10.1002/14651858.CD006198. *Evidence Update* published in February 2008.

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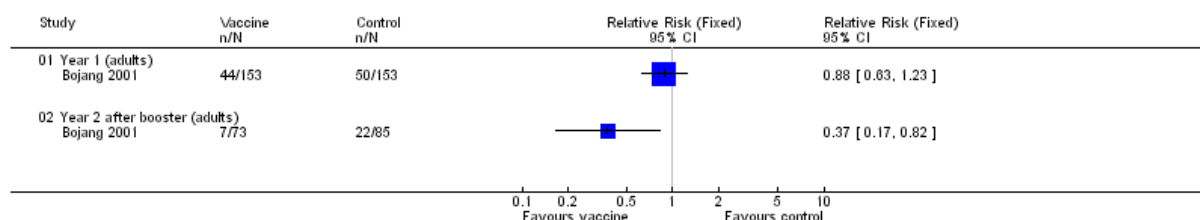
RTS,S vaccine versus control: severe malaria in children



RTS,S vaccine versus control: malaria illness in adults and children



RTS,S vaccine versus control: malaria illness by year



Authors' conclusions

Implications for practice:

The RTS,S vaccine shows promise, but further trials (both larger and in other age groups and malaria intensity settings) are needed to confirm the benefits. There is not enough evidence to assess the effectiveness of CS-NANP, CS102 and ME-TRAP vaccines.

Implications for research:

Further research is needed to assess the value of pre-erythrocyte malaria vaccines. Future trials should be designed to detect effects on malaria illness and severe malaria.