Evidence Update

Malaria Series

Do vaccines targeting the blood-stage of the malaria parasite prevent malaria infection and illness?

Blood-stage vaccines show promise, but require further development.

Inclusion criteria

Studies:

Randomized controlled trials.

Participants:

People of any age.

Intervention:

Intervention: vaccines containing antigens from blood (asexual) stages of any species of malaria parasite.

Control: placebo, control vaccine, or routine malaria control measures.

Outcomes:

Primary: malaria illness.

Secondary: new malaria infection, prevalence of parasitaemia, adverse events.

Results

- Five trials involving 217 participants were included; all assessed a vaccine derived from merozoite surface proteins and part of the ring-infected erythrocyte surface antigen (MSP/RESA). One trial (120 participants) assessed efficacy in a malaria-endemic area; it was conducted in Papua New Guinea and involved children aged 5-9 years. This was the only trial with adequate allocation concealment.
- There was no difference in malaria illness between vaccinated or unvaccinated children, either those who were treated with sulfadoxine-pyrimethamine before vaccination (60 participants) or those who were not (60 participants).
- In vaccinated children who had not been pre-treated with an antimalarial drug, parasite density was lower than in non-vaccinated children (weighted mean difference -238.0, 95% confidence interval -238.95 to -237.5; 31 participants).
- Vaccinated children had fewer new malaria infections with parasite subtype 3D7, which was targeted by the vaccine (relative risk 0.52, 95% confidence interval 0.28 to 0.99; 120 participants), but there was no difference in infections with the other main subtype, FC27.
- No differences in adverse events between vaccine and control groups were detected in trials using the dose of vaccine used in efficacy trials (3 trials).

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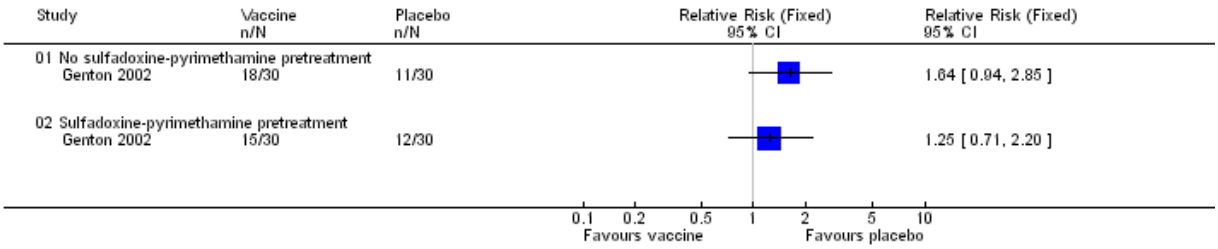
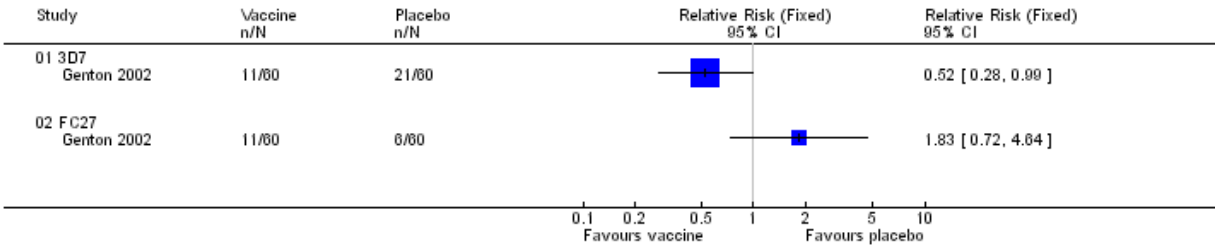
MSP/RESA vaccines versus placebo: malaria illness (stratified by pre-treatment)



MSP/RESA vaccines versus placebo: new malaria infections (stratified by parasite subtype)



Authors' conclusions

Implications for practice:

The first results from randomized trials of a blood-stage vaccine show promise, but the particular vaccine tested is not sufficiently effective to pursue without modification.

Implications for research:

Further development of the vaccine should include adding the other main allelic form of the antigen MSP2, and assessing the relative contribution of the three antigens in the vaccine.