A systematic review of effectiveness, immunogenicity and impact of paediatric hepatitis A vaccines

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Background: Hepatitis A virus (HAV) is vaccine preventable enterically transmitted and causes acute infection resulting in acute hepatitis, which can be severe, including fulminant hepatitis, in some cases. We undertook a systematic review to assess the efficacy, effectiveness, immunogenicity, epidemiological impact and economic impact of one-dose compared with two-dose HAV vaccination.

Methods: We searched MEDLINE, Scopus, Cochrane, SciELO and VHL for all studies using "hepatitis A" and "vaccination", and similar terms, from 2012 to 2026. Eligible studies addressed routine hepatitis A immunization targeting healthy populations aged up to 17 years, administered in non-outbreak settings, with follow-up of at least three years.

We identified 81 studies. Meta-analysis was conducted for disease, seroprotection and geometric mean concentrations (GMCs) of total or IgG anti-HAV antibodies. One-dose and two-dose study results were pooled and analysed separately for any duration, 3–7 years, or more than 7 years of follow-up, and by vaccine type: live attenuated or inactivated.

Results: In the 81 studies analysed, the maximum length of follow-up was 25 years (2 doses) and 15 years (single doses). We found no statistical difference in clinical disease or seroprotection between one and two doses, or between live attenuated and inactivated vaccines. However, GMCs were higher after two-dose compared with one-dose inactivated vaccines at both 3–7 years and more than 7 years of follow-up.

Seropositivity above 20 mIU/mL was demonstrated to 15 years after one-dose vaccination and to 25 years after two-dose vaccination. Modelling suggested long-term protection to 40 years and 60 years, respectively.

Regarding impact, the mean incidence of hepatitis A disease decreased in single-dose studies across all age groups by 59% to 99%, and in two-dose studies by 76% to 98%. In studies that reported incidence by age group, the largest decreases were observed in children aged under 10 years. No studies of impact on mortality or hospitalization rates were identified.

Conclusions: One-dose paediatric HAV vaccination is non-inferior to a two-dose vaccination schedule regarding seropositivity and protection against disease, although GMCs are higher after the two-dose schedule. Epidemiological and economic impact studies support one-dose HAV vaccination as an alternative in national planning to prevent HAV disease.

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