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Two-dose vaccine effectiveness following the first reactive mass vaccination campaign against hepatitis E in Bentiu, South Sudan

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Introduction

A three-dose recombinant vaccine against hepatitis E, Hecolin, has been licensed for use in China since 2011. While not recommended for routine use due to lack of evidence on burden in the general population, in 2015 WHO recommended the vaccine be considered in outbreaks. As of early 2022 however, the vaccine had not been used in outbreak settings. A reduced-dose vaccination schedule, if effective, could make the vaccine an important outbreak response tool. In response to an increase in hepatitis E cases in a camp for internally displaced people in Bentiu, South Sudan in late 2021, MSF and South Sudan's MoH implemented the first ever mass reactive vaccination campaign against hepatitis E virus (HEV). Three vaccination rounds took place in March, April, and October 2022, targeting 26,848 individuals aged 16-40 years, including pregnant women. We set up enhanced surveillance and conducted a case-control study to estimate two-dose vaccine effectiveness (VE).

Methods

All suspected cases presenting to the MSF hospital who were eligible for vaccination and provided consent were enrolled in the study, comprising a questionnaire, laboratory examinations and a follow-up visit after 2-4 weeks. Vaccine-eligible suspect cases were matched to community controls. We estimated two-dose VE against probable (anti-HEV IgM positive with elevated alanine transaminase, or a four-fold rise in IgG in paired samples) and confirmed (HEV RNA positive) hepatitis E using conditional logistic regression models.

Ethics

This study was approved by the MSF and South Sudan Ethics Review Boards.

Results

Considering the period two weeks after the second vaccination round between 11 May and 30 December 2022, 287 vaccine-eligible suspect hepatitis E cases were enrolled, including one probable and 16 confirmed cases. Among probable and confirmed cases, two (11.8%) were vaccinated with two or more doses compared to 40 (40%) of their 100 matched controls. We estimated a VE of 86.5% (95% confidence interval, CI, 36.3–97.1) for one/two doses and 83.9% (95% CI, -33.1–98.1%) for two doses. In addition to this direct protection, we observed a 5.5-fold decrease in the incidence rate of probable/confirmed cases hepatitis E cases before and after the second dose campaign (including those not eligible for vaccination). Laboratory confirmation of hepatitis E infection is ongoing, and we expect to revise VE estimates and incidence based on these results.

Conclusion

Following the first mass reactive vaccination campaign against hepatitis E, incidence has declined. Preliminary VE estimates suggest that the short-term protection provided by this reduced dose regimen may be high and potentially sufficient for outbreak response.

Conflicts of interest

None declared.