Interim results of the multi-site incidence study of Lassa fever in West Africa

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Background

Lassa fever (LF), a haemorrhagic illness caused by the Lassa fever virus (LASV), is endemic in West Africa causing an estimated 300 000 to 500 000 cases and 5 000 fatalities every year. Due to its pandemic potential, LF has been placed on the WHO's list of priority pathogens in order to speed up the development of a safe and effective vaccine. However, the design of successful vaccine trials depends on the true prevalence and incidence rates of LF, which are unknown as infections are often asymptomatic and clinical presentations are varied. The aim of the Enable Lassa research programme is to estimate the incidences of LASV infection and LF disease in five West African countries.

Methods

We conducted a prospective cohort study in Benin, Guinea, Liberia, Nigeria (three sites), and Sierra Leone from 2020 to 2023, with 24 months of follow-up. Each site assessed the incidence of LASV infection, LF disease, or both. When both incidences are assessed the LASV cohort (n = 1 000 per site) was drawn from the LF cohort (n = 5 000 per site). During recruitment participants completed questionnaires on household composition, socioeconomic status, demographic characteristics, and LF history, and blood samples were collected to determine IgG LASV serostatus. LF disease cohort participants were contacted biweekly to identify acute febrile cases, from whom blood samples were drawn to test for active LASV infection using RT-PCR. LASV infection cohort participants were asked for a blood sample every six months to assess LASV IgG serostatus.

Results

Interim results were obtained in October 2022 using partial data. We focus here on the Nigeria-Edo cohort with a follow-up period of 22 months and 3 serological time-points available (T0, T6, T12). We found a baseline seroprevalence of 43% (95% CI: 42% - 45%), an incidence rate of LASV infection of 13% (10% - 16%) and an incidence rate of LF disease of 0.2% (0.1% - 0.3%). These results suggest that LASV infection is common, but LF disease is rare in hotspot communities. Furthermore, our results suggest that pre-exposure to LASV may temporarily reduce the risk of LF disease. Finally, we found evidence that children may be at greater risk of LF disease than adults due to lower pre-exposure.

Conclusion

This is the first epidemiological study to measure the incidence of LF disease and LASV infection in West Africa. The estimates will serve as a basis for the design of future vaccine efficacy trials. The interim results, although limited due to partial data, already suggest that a large sample of several tens of thousands of participants will be required and that children should be included, provided that the candidate vaccine is safe and immunogenic in this group.

Incidence of Lassa fever is needed to inform vaccine trials. Preliminary results show frequent infections but rare disease, suggesting the need for large vaccine trials.