10 YEARS OF BREAKTHROUGHS A HEALTHIER FUTURE

Systems Analysis of Adults and Pediatric Responses to VSV-EBOV VSV-EBO PLUS

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Determinants of antibody persistence across doses and continents after single-dose rVSV-ZEBOV vaccination: an observational cohort study

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Facts & Figures

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Project website:	
www.imi.europa.eu/projects-results/project-factsheets/vsv-eboplus	

Challenge

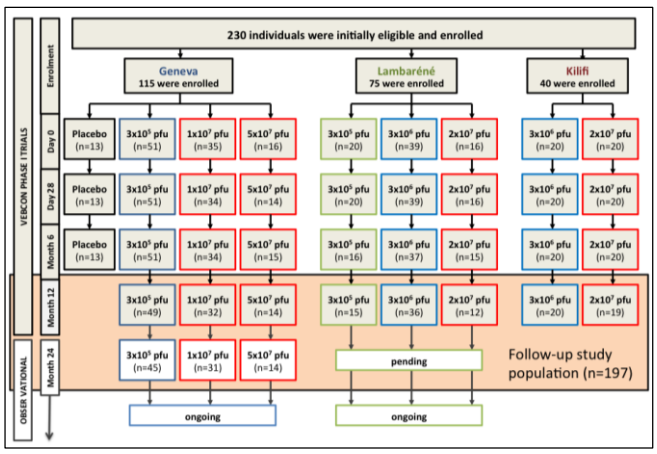
While the recombinant vesicular stomatitis virus (rVSV) vaccine expressing the Zaire Ebolavirus (ZEBOV) glycoprotein is immunogenic and efficacious in the weeks following single-dose injection, the durability of the immune response remains unknown.

Approach & Methodology

In 2014-5, healthy volunteers received single-injection rVSV-ZEBOV at different doses (300,000 [low dose, LD] or 10 to 50 million [high dose, HD] plaque-forming units [pfu]) in phase I trials taking place in Lambaréné, Gabon, Kilifi, Kenya, and Geneva, Switzerland. Volunteers are followed prospectively for ZEBOV-glycoprotein (GP) IgG antibody persistence; the primary outcome is ZEBOV-GP-specific IgG geometric mean concentrations (GMCs) measured yearly by ELISA, compared to one month after vaccination. We report IgG GMCs up to two years after vaccination and factors associated with higher antibody persistence beyond six months.

Results

Of the 217 original vaccinees (n=102, 75 and 40 in Geneva, Lambaréné and Kilifi, respectively), 197 returned and provided samples at one year (n=95, 63 and 39) and 90 at two years (Geneva). Most (184/197, 93%) had seroconverted by day 28, with the remainder seroconverting by months 2 or 3. Those who had seroconverted by day 28 had a high probability (≥89%) of remaining seropositive at one and two years (in the African sites and Geneva, respectively). Though in HD vaccinees, ZEBOV-GP IgG GMCs decreased significantly between their peak and month 6 (Geneva: p<0.0001; Lambaréné: p= 0.0298), GMCs remained stable thereafter at all sites. Antibody persistence was similar at one year in LD vaccinees, with lower two-year than one-year titres in Geneva (GMC ratio: 0.61 [0.49-0.77, p<0.0001]). In multivariate analyses, predictors of higher IgG GMC beyond six months included higher vaccine dose (Geneva: p=0.0133; Lambaréné: p=0.008) and the occurrence of vaccine-related arthritis (p=0.0176), but not gender, age or baseline seropositivity.

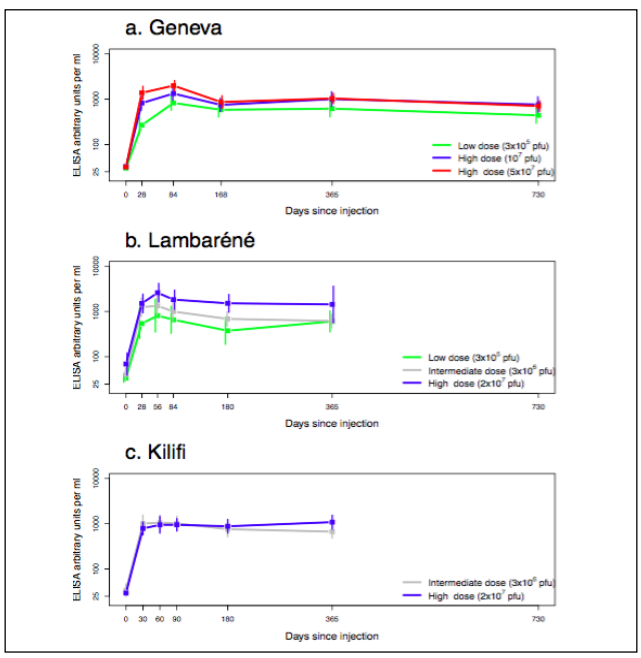


Value of IMI collaboration

The IMI-supported VSV-EBOPLUS Consortium allows for continued cross-national and cross-disciplinary collaboration for harmonised clinical data collection, centralised laboratory analysis, and collective, transparent reporting in the development of the VSV-vectored Ebola vaccine.

Impact & take home message

ZEBOV-GP-specific IgG antibody responses to single-dose rVSV-ZEBOV vaccination peak within the first three months after vaccination but are sustained at one and two years across dose ranges and settings; higher doses and vaccine-related arthritis are predictors of higher IgG GMC at time points beyond six months.



The full report can be found at *Lancet Infect Dis*. 2018 Jul;18(7):738-748

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