



TBE VACCINE EFFECTIVENESS, GERMANY

Background

In Germany, TBE vaccination is recommended to people with tick exposure, meaning living in, travelling to, or working in (officially declared) risk areas, and two TBE vaccines (FSME IMMUN and Encepur) are available in Germany. Despite this recommendation, vaccination coverage is low in risk areas (20%–30%), even in Bavaria and Baden-Wuerttemberg (federal states in the south) which made up around 85% of all TBE cases reported in Germany. The annual number of TBE cases is fluctuating from year to year with 529 cases on average from 2017 to 2020, and 71% of the cases occur in 58 areas with highest incidence (there are currently 175 TBE risk areas in total). Vaccination effectiveness (VE) has been calculated for Austria and Switzerland and reaches 90% or more, depending on adherence to the recommended vaccination schedule and age of the vaccinees. VE effectiveness has now been calculated on the case-control approach. In total, 581 of 1,220 eligible cases (48%) participated, without indication of bias. Routine surveillance data on vaccination status was available for 566 cases (97.4%).

Results

VE after ≥ 3 doses with the last dose on-time was 96.6%. When the time intervals were exceeded (more than 3 or 5 years, but less than 10 years), VE was 91.2%. For at least 3 doses and last dose 5–10 years ago, VE was 82.4%, and if the last dose was more than 10 years ago, VE was 88.6%. For at least 3 doses on time and at least 3 doses not on time, but less than 10 years ago, the combined VE was 95.2%.

VE after at least 3 doses for homologous vaccination series with either FSME IMMUN or Encepur was similar (93.1% and 95.8%, respectively), and VE was 93.9% for heterologous vaccination. No decrease in VE was observed when primary vaccination course had irregular timing.

Vaccine breakthrough infections (17 VBIs of 581 cases, 2.9% of all cases, but most of them could not be diagnostically validated) did not cluster spatially, and thus they are unlikely to be caused by local virus variants that escape vaccine-induced immunity. Acute severity in incompletely vaccinated patients was the same as in non-vaccinated individuals, even at less than 30 days since the last dose, or when only one or two doses had been given, providing no antibody dependent enhancement (as described for, e.g., Dengue virus and sometimes discussed for TBE virus).

Ten of the 17 VBIs had received 3–4 doses, 4 had 5–6 doses and the remaining 3 had 8–9 vaccine doses. 10 patients had received the homologous vaccination course (6 FSME IMMUN, 4 Encepur) and 4 patients had a heterologous vaccination course (for 3 patients, data were lacking). The median interval for VBIs was 4.5 years (range: 1 day to 39.6 years).

Vaccination barriers in Germany were similar in cases and controls, which were mainly due to low-risk perception regarding disease (60% to 75%) and fear of adverse events following vaccination (20% to 40%).

Discussion

Data presented in this study showed a high VE independent of the vaccine used (FSME IMMUN or Encepur) and if the vaccination series was homologous or heterologous. The authors concluded that the observed duration of high VE may inform decision-makers to consider extending booster intervals to 10 years (see [Newsletter June 2022](#) about 10-year booster interval recommended in Switzerland).

In Germany, the vaccination coverage is low, and actions are warranted to increase TBE vaccine uptake. The authors suggest addressing complacency of (so far non-vaccinated) individuals and address (more) confidence in the



tolerability and safety of the vaccine, both to population and physicians.

Literature

Nygren et al.

Tick-borne encephalitis vaccine effectiveness and barriers to vaccination in Germany

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