Background: The Brazilian state of Paraná conducted a mass vaccination campaign against dengue with the tetravalent attenuated vaccine CYD-TDV. The campaign targeted thirty endemic municipalities. The objective of this study was to assess the effectiveness of CYD-TDV in preventing symptomatic virologically confirmed dengue cases according to specific age groups in five of the municipalities.

Methods: A case-control study was carried out in the five most populous municipalities targeted by the vaccination, with a vaccine uptake of 25%. Symptomatic dengue cases were identified by the municipal health departments. The age groups targeted were 15–18 and 19–27 in four municipalities and 9–14 and 28–44 in one municipality. All cases were confirmed by real time reverse transcription quantitative polymerase chain reaction (RT-qPCR). For each case, two controls were selected: a neighbourhood control and a workplace or school/college control, matched by age group. A conditional logistic regression model was used to determine the odds ratio for vaccination and the vaccine effectiveness.

Findings: Study participants included 618 RT-qPCR-confirmed dengue cases and 1,236 matched controls (with a non-reactive dengue IgM serologic test). Vaccine effectiveness against dengue due to any serotype was 11·1% (95% CI: –19·0%; 33·6%). Effectiveness against DENV-1 was 33·3% (95% CI: -5·0%; 57·6%) and against DENV-2 was -56·7% (95% CI: -142·2%; -5·0%). No DENV-3 was detected. The vaccine was significantly effective in the prevention of DENV-4 cases (VE = 93·3%; 95% CI: 47·7%; 99·2%).

Interpretation: CYD-TDV was effective in the prevention of symptomatic cases due to DENV-4, but not due to any serotype. The low dengue seroprevalence in the target population could possibly be related to these results.

Funding: This study was supported through a grant to the Sabin Vaccine Institute from Sanofi-Pasteur. Sanofi-Pasteur
had no role in the study design, protocol development, data collection, analysis, or publication of results.

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End date: 12-31-2021

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A case-control study to determine the effectiveness of a tetravalent dengue vaccine in the State of Paraná, Brazil - Description of Data and Metadata produced by the project

Data Creation and Collection

What data will be collected or created?

Status of the participants: dengue case (with a confirmed PCR test) OR control (without signs or symptoms of dengue, and a negative IgM serologic test for dengue

Age

Sex

Dengue vaccination status: fully vaccinated (3 doses); incomplete vaccination (one or two doses); non-vaccinated

Participant previously reported as a dengue confirmed case (YES or NO)

How data will be collected or created

The data were collected in interviews with the participants. Data on dengue diagnosis were retrieved from the GAL (Gerenciador de Atividades Laboratoriais) platform, run by the Ministry of Health. Data on dengue vaccine status were obtained from the vaccine registry of Secretaria Estadual de Saúde do Paraná (SESA-PR).
Planned Research Outputs

Estimates of the cyd-tvd vaccine effectiveness - "Effectiveness of CYD-TVD"

Effectiveness is obtained by the formula: 1 - OR

Data paper - "A case-control study to determine the effectiveness of a tetravalent dengue vaccine in the State of Paraná, Brazil"

The paper contains data on:

- Vaccine coverage
- Proportion of cases who were vaccinated against dengue
- Proportion of controls who were vaccinated against dengue
- Dengue Vaccine effectiveness estimates

Planned research output details

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