Meningococcal serogroup C (MenC) immune response of a novel tetanus toxoid conjugate quadrivalent meningococcal vaccine (MenACYW-TT) compared to MenC-TT or non-monovalent (MenC-TT) meningococcal vaccine in healthy meningococcal vaccine-naïve toddlers

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BACKGROUND & RATIONALE

- **MenACYW-TT (MenQuadri)**: recently licensed quadrivalent meningococcal conjugate vaccine for use in individuals 12 months and older in the EU and some other countries.
- **Comparing epidemiology of MenC**: - Invasive meningococcal disease (IMD) caused by Neisseria (N) meningitidis is a preventable and severe illness.
- The distribution of meningococcal serogroups causing invasive meningococcal disease (IMD) varies geographically and with time.- During the late 1990s, the incidence of IMD due to serogroup C increased in many EU countries, and several countries have introduced a monovalent MenC vaccine in their routine national immunization programme.- During the past decade, an increase in the incidence of IMD due to serogroups W & Y has been observed.
- A quadrivalent vaccine able to offer protection against multiple serogroups, including MenC as a monovalent MenC vaccine supports the switch to quadrivalent vaccines in countries with higher MenC vaccine coverage. - MenACYW-TT has demonstrated non-inferiority of immune response (seroprotection) against serogroups C and W compared to MenW & Y in a pivotal study conducted vs MCV4-TT (NeisVac®-10, in toddlers, with higher GMTs observed for MCV4-TT).
- Consequently, the current study was conducted in meningococcal vaccine-naive toddlers (12-23 months) with the aim - Comparing the serogroup C immune response of MenACYW-TT (MenQuadri) vs MenC-TT (NeisVac®-1) and vs MCV4-TT (Nimenrix®), in terms of GMTs and seroprotection.- Testing the non-inferiority and superiority of serogroup C immune response.

METHODS

- **This was a modified phase II trial (double-blind, randomized 1:1:1), panel groups, active-controlled, multi-center trial** conducted in Denmark, Germany, and France.
- **Participants were randomly assigned to receive a single dose of either MenACYW-TT conjugate vaccine or the licensed MenACWY-TT** vaccines.
- The study was conducted between September 2019 (first visit, first subject) and October 2020 (last visit, last subject).

Immunogenicity assessment:

- Serum bactericidal antibodies with human complement (hSBA) and rabbit complement (rSBA) were used to measure antibodies against the serogroup C at baseline (Day 0 D0) and 30 days post-vaccination (D30).
- **The primary objective of the study** will be met if, objective 1) non-inferiority of the serogroup C GMTs at D30 following a single dose of MenACYW-TT compared to MenC-TT or MCV4-TT is demonstrated.
- **Secondary immunogenicity objectives:**
  - The distribution of meningococcal serogroups causing invasive meningococcal disease (IMD) varies geographically and with time.
  - Consequently, the current study was conducted in meningococcal vaccine-naive toddlers (12-23 months) with the aim.

RESULTS

- **Table 1: Safety assessment**
  - Safety assessment - Summary of safety findings
    - No serious adverse events were reported. The trial (Safety Monitoring Board) was satisfied with the safety profile of MenACYW-TT.
    - A total of 824 participants were included in the analysis (MenACYW-TT n=271, MenC-TT n=275, MCV4-TT n=278).
    - Most common solicited local and systemic reactogenicity events were pain at the injection site and fever, respectively.
    - The incidence of solicited local events was similar between the three arms (MenACYW-TT 42.4%, MenC-TT 43.8%, MCV4-TT 40.7%).
    - The incidence of solicited systemic events was similar between the three arms (MenACYW-TT 7.0%, MenC-TT 7.6%, MCV4-TT 8.0%).

CONCLUSIONS

- **The trial met all primary and secondary objectives:**
  - MenACYW-TT induced a similar immune response in meningococcal vaccine-naïve toddlers.
  - Superiority of serogroup C hSBA seroprotection rates and non inferiority of serogroup C GMTs seroprotection rates of MenACYW-TT over MenC-TT or MCV4-TT was demonstrated.
  - Non-inferiority of serogroup C GMTs was demonstrated.

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- All participating investigators and clinical sites were paid for their activities.
- The study was conducted in accordance with Good Clinical Practice (GCP) and the Declaration of Helsinki.

REFERENCES