VAC_17 - Antibodies induced by the Brazilian vaccine against N.meningitidis serogroup B inhibit adhesion of vaccine strains to epithelial cells

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Introduction: A phase II/III study of a Brazilian tailor-made meningococcal B vaccine in children from 4 to less than 12 years was designed after promising results from phase I study. A randomized study using three concentrations of vaccine antigens were compared with VAMENGOC-BC® vaccine.

Objectives: In experimental vaccines were used the following protein antigens concentrations: 50μg, the same used in VAMENGOC-BC®; half (25μg) and 1⁄4 (12.5μg). All test vaccines received 1⁄2 the protein concentration in dLOS and aluminum hydroxide as adjuvant. Vaccination-adopted scheme was a primary immunization with three doses with two-months apart and a booster 6-12 months after the third dose.

Methodology: Sixteen volunteers from each vaccine group constituted a subsample of phase II/III study to evaluate the role of vaccine-induced antibodies in inhibiting the adhesion of vaccine strains to epithelial cells. Epithelial cell line Detroit-562 were used in adherence, invasion and persistence assays. Mid-log-phase bacteria were cultured and added to each well with MOI 100 bacteria/epithelial cell. To determine the level of bacterial adhesion, 96-well plates were prewashed and lysed. For invasion and persistence assays, all strains were shown to be susceptible to ≤ 150 mg/mL of gentamicin and incubated for 1h. and 24h. respectively. Invasion and persistence ability was expressed as the percentage of inoculum that survived after the incubation period.

Results: The results were recorded as percentage of the original inoculum. Antibodies induced by the experimental vaccines inhibited adherence from 44 to 53% of the first prevalent, N44/89, and from 40 to 100% of the second strain, N603/95. When compared to the reference vaccine, the inhibition observed in Vamengoc-BC was 36 and 60%, respectively, for the vaccine strains.

Conclusion: The results suggest greater pathogenicity of N44/89 strain compared to N603/95, which justifies its role as the main cause of meningococcal meningitis by serogroup B in the country. They also suggest that antibodies induced by test and reference vaccines, both consisting of outer membrane vesicles vaccines, are important in reducing N.meningitidis adhesion to the epithelium, an important phenomenon in meningococcal disease.

Keywords: Neisseria meningitidis, vaccines, adherence assay