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Abstract (oral session)

Evaluation of the polypeptide vaccine protection efficacy against group B streptococcal infection

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Objectives: Group B streptococcal (GBS) infection is the leading cause of bacterial infections during pregnancy and newborn mortality. The existence of ten capsular serotypes among GBS strains has produced challenges in development of an effective polysaccharide vaccine. In this study various combinations of five recombinant polypeptides exhibiting immunogenic and protective properties have been examined in the neonatal mouse model. Furthermore the advantage of pentavalent polypeptide vaccine has been demonstrated. Methods: Recombinant polypeptides were constructed based on Bac, ScaAB, SspB1, ScpB and CspA. PCR-generated DNA fragments were cloned and expressed in E.coli. Three different mixtures of the polypeptides including two and five components were administered subcutaneously in female mice with alum adjuvant. Immunogenicity was evaluated by ELISA using anti-mouse IgG conjugated with HRP. GBS 5/70 strain serotype Iac was used for intraperitoneally challenge in newborn pups. Results: After cloning of the DNA fragments the appropriate recombinant polypeptides were successfully expressed and purified. The immunized mice were bred after the polypeptide vaccine booster. The offspring of all groups was infected intraperitoneally with GBS and monitored during next three days. Within 24 hours 100% of the newborn mice mortality was registered in the control group. 13% and 22% offspring survived in the groups of the mice immunized with two component vaccines. Meanwhile, 50% offspring survivals from the mice immunized with five component vaccine were noticed. IgG against all five components was detected in the females blood during immunization period as well as after mouse breeding. The IgG titer was estimated from 1:3,2x10^4 to 1:1,0x10^6 depending on the recombinant polypeptide. IgG level against the individual components was at least two times higher after the administration of the five component vaccine in comparison with the two component ones. Specific IgG against vaccine components was also found in the blood of the surviving pups which might indicate the protective effect of maternal IgG. Conclusion: The study has demonstrated the advantage of the pentavalent polypeptide vaccine: 50% neonatal mouse protection against GBS challenge and synergistic effect of specific IgG production. The study was supported by RFBR grant 10-04-00750a.