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Poster Session V
Immunology, vaccination and host defences

THE SYNTHETIC STREPTOCOCCUS PNEUMONIAE OLIGOSACCHARIDE CONJUGATE PROTECTED MICE FROM SEVERE PNEUMONIA

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Objectives: Vaccination is the most important prophylactic strategy used worldwide to prevent invasive pneumococcal diseases. However, high costs of currently approved vaccines limit their administration, particularly in developing countries. Moreover, existing polysaccharide vaccines comprise only a part of the clinically relevant pneumococcal serotypes. An innovative chemical method enables the synthesis of almost any capsular polysaccharide antigen of *Streptococcus pneumoniae.* Thereby, a cost-efficient rapid production of polyvalent vaccines is possible according to the clinical and epidemiological necessity. In the current pilot study, the protective effect of a new glycoconjugate vaccine consisting of a synthetic capsular oligosaccharide of *S. pneumoniae* serotype 3 was examined.
Methods: Female C57Bl/6 mice were subcutaneously immunised with monovalent glycoconjugate with or without the adjuvant aluminium hydroxide (alum). Mice were boosted twice at two week intervals prior to transnasal infection with *S. pneumoniae* serotype 3.
Results: The synthetic glyconconjugate vaccine induced the production of specific antibodies against serotype 3 capsular oligosaccharide in mice. Infection with *S. pneumoniae* was associated with hypothermia and loss of body weight in non-vaccinated controls and glycoconjugate vaccinated mice, but not in mice immunised with glycoconjugate and alum. Bacterial load of lung, bronchoalveolar lavage fluid and blood was significantly decreased in mice vaccinated in combination with the adjuvant. Immunisation with glycoconjugate and alum prior to pneumococcal infection reduced cytokine release (IL-6, IL-10, IFN-gamma) into the bronchoalveolar space and prevented damage of the endoepithelial barrier.
Conclusions: Immunisation with *S. pneumoniae* serotype 3 oligosaccharide conjugate improved pulmonary bacterial elimination and protected mice from severe pneumococcal pneumonia by inducing protective antibodies.

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