V1 - Synthesis and Humoral immune response of the S. pneumoniae serotype 1 (PS1) and pneumococcal surface protein A (PspA) conjugate

Luciene Oliveira Machado[1]*; Giovana Cappio Barazzone[2]; Martha Massako Tanizaki[2].

1 - USP - Instituto Butantan;
2 - Instituto Butantan.

Introdução:

Streptococcus pneumoniae is a pathogenic encapsulated bacterium that causes infectious diseases such as pneumonia, meningitis, bacteremia, peritonitis, sepsis, osteomyelitis. The antigen of vaccines against S. pneumoniae are capsular polysaccharide (PS) free or conjugated to a carrier protein. The advantage of a conjugated vaccine is to change the PS from a T-cell independent antigen to a T-cell dependent antigen causing generation of memory cells.

Objetivo:

Synthesis and evaluation of the humoral immune response of the capsular polysaccharide of S. pneumoniae serotype 1 (PS1) and pneumococcal surface protein A (PspA) conjugate.

Metodologia:

1) Conjugation. The conjugate was obtained in three steps: hydrolysis of the polysaccharide, carboxamide formation (PS1-AH) and conjugation reaction between PS1- AH and PspA. The PS1-PspA conjugate was purified by size exclusion chromatography was performed in Sephacryl S-300 and eluted with 0.15M NaCl, 0.05M Na2HPO4, pH 7.0 at flow rate of 1.0 ml/min. Polysaccharide and protein contents were measured by phenol-sulfuric and bicinchoninic acid (BCA) methods, respectively.
2) Immune response. Female BALB/c mice were immunized intraperitoneally with PS1–PspA conjugate and the controls (PS1 and PspA). The humoral immune response againt both PS1 and PspA after tree immunization with PS1-PspA conjugate and PS1 and PspA co-administered was evaluation by ELISA.

Resultados:

The average molecular weight of the PS1 after hydrolysis decreased from 1,000 kDa to about 26 kDa. The carboxamide formation introduced 3 groups NH2 per molecule of PS1. The group NH2 of the PS1-AH reacted with the carboxyl group of PspA. The purification of the conjugates by size exclusion chromatography, Sephacryl S-300 resin, was efficient. PS1 conjugation to PspA increased the induction of anti-PS1 IgG after the third immunization, which indicated the change of immune response against PS from T cell independent to T cell dependent response. Conjugation did not alter the immune response induced against PspA.

Conclusão:

The results showed an efficient method of synthesis of PS1-PspA conjugate. Furthermore, our data revealed the capacity of PspA to be used as antigen and carrier protein to PS1.

Palavras-Chave: S. pneumoniae, conjugated vaccine, S.pneumoniae serotype 1