Las concentraciones indujeron AN en la mayoría de los animales frente a cepas del grupo B (LAI, IIIB y MN) todas representadas en el PMA. La poca respuesta frente a la cepa JY1 utilizada se podría explicar por las diferencias genéticas entre ésta y los epítopes de la incluida en el TAB9. Otros autores coinciden en la presencia de una actividad neutralinzante, cepa específica frente a cepas homólogas (4, 5). Se confirmó que TAB9 posee actividad inmunogénica en macacos, aún cuando no se ha evaluado la respuesta después de la cuarta dosis.

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T CELL RESPONSES INDUCED IN HUMANS BY NASAL IMMUNIZATION WITH MENINGOCOCCAL OUTER MEMBRANE VESICLES AND WHOLE CELL Bordetella pertussis

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Introduction

Mucosal administration of vaccines may induce local mucosal as well as systemic immune responses (1). In this work we have studied the ability of non-living particulate complex bacterial vaccine antigens to induce cellular immune responses in humans when administered nasally without any mucosal adjuvant.

Materials and Methods

Normal healthy volunteers were given meningococcal serogroup B (B:15:P1.7,16:L3,7,9) outer membrane vesicles (OMV) (n = 12) (250 µg protein) or formalin inactivated whole cell *B. pertussis* (n = 6) (250 µg protein) as nasal drops, or spray, once a week for 4 weeks. Peripheral blood mononuclear cells were assayed at several intervals for proliferative responses by the thymidine incorporation method against the primary vaccine antigens (OMV and *B. pertussis)* as well as purified antigens: OMV class 1 and 3 proteins, *B. pertussis* filamentous hemeagglutinin (FHA), and pertussis toxoid (Ptd). IgA antibody levels against OMV and *B. pertussis* in nasal secretions were measured by ELISA (1, 2).

Results

After nasal immunization with OMV, 5 and 11 of 12 vaccinees showed a vaccine induced proliferative T cell response to OMV and the OMV class 1 antigen, respectively. No vaccine induced response to the OMV class 3 antigen was detected. Nasal immunization with whole cell *B. pertussis* resulted in elevation of the T cell response to the whole cell antigen in all 6 vaccinees. In addition, most of these vaccinees also showed significant responses to FHA and Ptd. Both when meningococcal OMV and *B. pertussis* were used as mucosal immunogens, we could demonstrate a positive correlation between antigen specific T cell responses and IgA antibody levels in nasal secretions (1, 2).

Discussion

The potential of mucosal immunization to induce effective immunity is now explored for several pathogens, but the mucosal adjuvants necessary to promote and enhance the relevant immune responses are still a matter of debate (1). We have in this work demon-strated that non-proliferating particulate antigens, like meningogoccal OMV and *B. pertussis*, can induce antigen specific T cell responses in humans when administered nasally without adjuvant. With respect to the humoral response, both of these vaccine antigens also induced nasal IgA antibody production (1, 2) which is putatively regulated by T helper cells. In conclusion, the bacterial non-replicating particulate antigens studied here may have the intrinsic capacity to function alone as mucosal vaccines.

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