EFFECT OF BCG ON ANTIBODY AND CYTOKINE PRODUCTION

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Key words: BCG, spleen cells, cytokine, splenic index.

Introduction. Bacillus Calmette-Guerin (BCG), since its discovery and application as a vaccine against tuberculosis (TB), has been applied worldwide for several decades. The degree of protection against TB that its administration confers has varied enormously in different parts of the world. However, various factors may also interfere with the efficacy of BCG vaccination. One major problem is linked to the observation that protection varied among vaccines prepared with same BCG strain (1). Therefore, variations in the methodology for vaccine manufacture could result in important differences when BCG invade host cells. BCG samples were derived from the original seed and cultivated in different culture media. Oral-BCG (O-BCG) was cultured in medium Instituto Viscondessa de Morais, whereas Intradermic-BCG (ID-BCG) has been cultivated in Sauton medium. Samples of ID-BCG and O-BCG were used to ascertain whether different procedures affects their immunological characteristics and features of the response obtained when administered to BALB/c mice.

Methodology. BALB/c mice were infected intravenously route with BCG samples. At different times after infection the animals were bled and collected their spleens. Cell number and viability were determined in a hemacytometer by trypan blue exclusion. Specific antibodies against whole BCG bacterial extracts were estimated by a ELISA. The levels of IL-6, IL-10 and IFN-γ present in sera were assayed by ELISA method. The levels of TNF present in sera were used as a standard bioassay with L-929 cells.

Results and Discussion. Under the conditions used it was observed that, after freezing-drying the ID-BCG number is reduced around 36.8%, and after storage at 4°C for 30 days reduced the stability of both bacilli to 58.6 and 48% for O-BCG and ID-BCG, respectively.

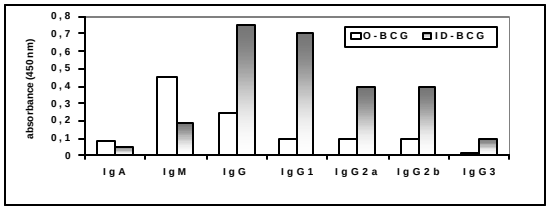

Figure 1. Antibodies production.

Figure 1 shows that the immunoglobulin isotypes endowed with antibody against BCG antigens were studied in pooled sera from mice immunized with BCG: a) IgA and IgM antibodies were high in mice immunized with O-BCG and ID-BCG, respectively and b) IgG1, IgG2a, IgG2b, IgG3 and IgE antibodies were detected in high levels in mice immunized with ID-BCG.

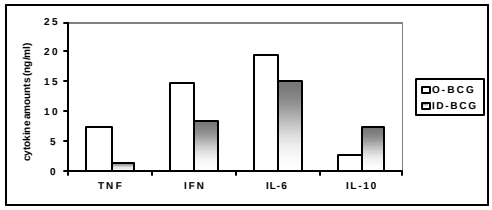

Figure 2. Cytokine response.

Figure 2 shows the cytokines responses, the highest levels of TNF, IL-6 and IFN-γ were observed in sera from mice immunized with O-BCG. In contrast, mice immunized with ID-BCG produced higher amounts IL-10.

Conclusions. Comparative analysis these two BCG bacilli in sera from BALB/c mice demonstrated that a difference exists between them in their immunogenicity after immunization. In this study, the antibody production was most pronounced when groups of mice were immunized with ID-BCG. The effect of two types of growth bacilli was also evaluated cytokine production. These results indicate more high levels IFN-γ, IL-6 and TNF after O-BCG and higher IL-10 levels with ID-BCG. These results suggest that there are considerable differences in the immunogenicity of two BCG bacilli that were cultivated in different culture medium and these differences may play a major role in BCG immunization efficiency.

Acknowledgement. Financial support received from Fundação de Amparo a Pesquisa do Estado de Sao Paulo (FAPESP).

References 1.Petricevich,V.L.(2001).A single strain *M. bovis* bacillus Calmette-Guerin (BCG) grown in two different media

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