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The studies on latent TB infection

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The studies on LTBI (Latent tuberculosis infection) were performed in the following aspects: (1) The epidemiology of LTBI I in 907 cases of recruits was studied using PPD skin test and ELISPOT assay. The rate of LTBI was 30.7%. The rate of LTBI in 897 recruits from 9 provinces was related to the severity of local tuberculosis epidemic. The results suggest that the ELISPOT assay could reflect the state of LTBI. There was no significant difference among the LTBI rates of the recruits from the city, urban and rural area, which is probably because the 72.6% recruits were high school graduates. (2) The mechanism of LTBI was studied. We found that resuscitation promoting factor could promote the resurrection and growth of dormant *M. tuberculosis*, and improve the positive rate of *M. tuberculosis* culture. The biological and immunological characteristics of some hypoxiarelated proteins and nutrient deficiency-related proteins were studied, and found that there were some proteins with better immunogenicity. Some immune molecular markers were screened and verified. Under the stimulation of these antigens, the number of effector T cells secreting IFN-y in LTBI group was significantly higher than those in active TB group and uninfected normal control group, which will provide new targets for the diagnosis of LTBI and the development of LTBI vaccine. (3) The new method of LTBI detection was studied. The consistent rate between PPD skin test and ELISPOT assay had only 51.4%, and between two kinds of IGRA (ELISPOT and ELISA) was not also entirely consistent. ESAT6 protein was the dominant antigen in Chinese population, but the reaction of effector T cells to CFP10 protein was stronger than ESAT6 protein. The positive rate of ELISPOT in the population with BCG vaccination was significantly reduced in comparison with the population without BCG vaccination, suggesting that BCG vaccination can partially protect the people against the tuberculosis infection, and reduce tuberculosis high-risk population. BCG vaccination is benefit to the PPD-negative and ELISPOT-negative children and adults. Therefore, we implemented the strategy of BCG vaccination in the PPD-negative recruits of Beijing army. The development of new antigen for skin test will improve significantly the specificity of LTBI detection. (4) 132 PPD-strong positive or 278 ELISPOT-positive recruits were followed up for 18 months. All did not induce the TB, suggesting that a few PPD-positive or IGRA-positive persons will develop active tuberculosis in the future. (5) The immunogenicities of 3 hypoxia-related DNA vaccines (Rv2029c, Rv2628 and Rv1813c) and 1 nutrient deficiency-related DNA vaccine (Rv2659c) were studied, found that these 4 DNA vaccines could induce low or medium level of IgG antibody, specific IgG1 and IgG2a antibody subtypes in mice, and IgG2a level was higher than IgG1. IFN-y and IL-4 levels in the supernatant of murine spleen lymphocyte culture were not increased. The percentage of Th1 cells secreting IFN-y was less than that of Th2 cells secreting IL-4 in the blood PBMCs by the flow cytometry, but CD4+CD25+FoxP3+ regulatory T cells in whole blood were significantly increased, suggesting the DNA vaccines encoding LTBI proteins induce Th2-type of cellular immune responses.

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