

Relationship between non-and-hyporesponders to hepatitis B vaccine and their serum interleukine-2 or interleukine-6 levels

Ling-Bin Kong, Dong-Sheng Gao, Xian-Qiang Mi, Feng-Li Wang

Ling-Bin Kong, Dong-Sheng Gao, Xian-Qiang Mi, Feng-Li Wang, Department of Nuclear Medicine, Affiliated Hospital of Jining Medical College, Jining 272129, Shandong Province, China

Author contributions: All authors contributed equally to the work.

Correspondence to: **Ling-Bin Kong**, Department of Nuclear Medicine, Affiliated Hospital of Jining Medical College, Jining 272129, Shandong Province, China
Telephone: +86-537-2886242

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Abstract

AIM: To explore molecular biology developing mechanism of non and-hyporesponder.

METHODS: Thirty children (3-7 years old) were selected whose anti-HBs titres were lower than 10 min/mL and HBsAg, anti HBc were negative. 843 children were defined as non-and-hyporesponders. Control groups were 30 normal responders to HB vaccine. Experiment groups and control groups Peripheral venous blood was drawn in preservative-free heparin (25 U/mL), and unfractionated mononuclear cells were obtained by Ficoll gradient centrifugation. Cell suspensions were routinely incubated in complete culture medium at 37 °C for 1 h before cultured to eliminate cytophilic antibodies. Mononuclear cell concentration of cell suspensions must be geared to 1×10^5 cells/mL with complete culture medium, taking these cell suspensions (1 mL) into flatbottom 24-well culture plates, then ConA 10 mg/L was added to wells and the plates were incubated at 37 °C in a humidified atmosphere of 95% air and 5% CO₂ for 48 h. This cell culture supernatants were removed to test tubes and level centrifugation (2000 rpm) for 10 min, upper liquid was samples of IL-2 or IL-6. IL-2 or IL-6 activity was measured by

CTLL-2 cells or 7TD1 cells toxin transfer test methods respectively. The results were expressed as stimulation index (SI) which represent the ratio of the mean counts per minute in quadruplicate well containing IL-2 (or IL-6) samples or IL-2 (or IL-6) standard solution to the mean counts per minute in quadruplicate wells containing cells and medium only.

RESULTS: Interleukin-2 (IL-2) mean activity (74.5 ± 64.1 U/mL) of the non-and-hyporesponders to hepatitis B vaccine in the 20 subjects was much less than that of the normal responder groups (298.0 ± 101.1) to hepatitis B vaccine ($t = 5.23, P < 0.01$); The correlation coefficient (r) between the anti-HBs levels and IL-2 activity in the 20 normal response to HB vaccine was 0.68 ($r = 0.68, P < 0.05$). There was a positive correlation between the anti-HBs levels and IL-2 activity. Difference in interleukin-6 mean activity was noted in serum from subjects who responded to HB vaccine compared with those who failed to respond. The responder groups (58.98 ± 16.4) had a significantly higher IL-6 activity than the non-and-hyporesponder groups (30.10 ± 12.4) ($t = 5.68, P < 0.05$). The correlation coefficient of the IL-6 activity and titers of serum anti-HBs in the responder groups was 0.79 ($P < 0.05$).

CONCLUSION: Some cytokines as IL-2 and IL-6 play an important role in the response to HB vaccine.

Key words: Hepatitis B virus; Hepatitis B/prevention and control; Hepatitis B antibodies; Hepatitis B surface antigens; Interleukin-2/blood; Interleukin-6/blood; Hepatitis B vaccine; Non-and-hyporesponder

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