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## Original Article

Immunoregulatory Cytokine (TGF- $\beta$  And IL-10) Responses in Mice Inoculated With Protoscolexes and Major Hydatid Fluid Antigens of Cystic EchinococcosisA Haniloo<sup>1</sup>, F Ghasemi<sup>1</sup>, Ak Shikhi<sup>1</sup>, MB Ghavami<sup>2</sup><sup>1</sup>Dept. of Parasitology and Mycology, Faculty of Medicine-Zanjan University of Medical Sciences, Iran<sup>2</sup>Dept. of Microbiology and Immunology-Faculty of Medicine-Zanjan University of Medical Sciences, Iran

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## Abstract:

Background: Our objectives were to investigate whether immunomodulatory cytokines, TGF- $\beta$  and IL-10, are stimulated in response to cystic echinococcosis (CE) components in mice model, and whether major hydatid fluid antigens or live protoscolexes could equally contribute to such cytokines.

Methods: Protoscolexes were obtained by aseptic puncture of fertile sheep hydatid cysts. Hydatid fluid antigens (HFAGs) and Antigen B (AgB) were prepared by partial purification and electroelution, respectively. Of the 25 Balb/c mice assigned in four groups, the first group was inoculated ip with 2000 live protoscolexes; the second and the third groups were injected ip with 50  $\mu$ g HFAGs and 50  $\mu$ g AgB in 200  $\mu$ l of PBS, respectively. Control group was only injected with PBS. The sera concentration of TGF- $\beta$  and IL-10 were determined by ELISA. Data were analyzed using One-Way ANOVA and Tukey-HSD tests to compare differences between means.

Results: The mean concentration of TGF- $\beta$  in those groups injected with protoscolexes, HFAGs and AgB were significantly higher than control group. However, in the case of IL-10 such differences were only detected in mice that were inoculated with protoscolexes (356 $\pm$ 11 pg/ml) compared to control (207 $\pm$ 9 pg/ml), HFAGs and AgB groups.

Conclusion: TGF- $\beta$  and IL-10, two important immunomodulatory cytokines are induced by different molecules or components of CE, so that AgB could induce TGF- $\beta$  and components of protoscolex, other than AgB and Ag5, could induce IL-10.

## Keywords:

Echinococcus granulosus , Protoscolex , AgB , TGF- $\beta$  , IL-10

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