Decline in immunological responses mediated by dendritic cells in mice treated with 18α-glycyrrhetinic acid

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Abstract

Objective: 18α-Glycyrrhetinic acid (18α-GA), a bioactive component of Glycyrrhiza glabra, has been shown in vitro immunomodulatory effects on dendritic cells (DCs). The aim of the present study is to evaluate the in vivo effect of 18α-GA on DCs and T cell responses. Methods: 18α-GA was intraperitoneally administered to mice and splenic DCs were evaluated for expression of co-stimulatory molecules using flow cytometry. Isolated DCs were added to mixed lymphocyte reaction (MLR) and the proliferation of T cells was measured using BrdU assay. The level of IFN-γ in the MLR supernatant was determined by enzyme-linked immunosorbent assay. The in vivo effect of isolated DCs on antigen-specific delayed type hypersensitivity (DTH) response, and the number of regulatory T (Treg) cells in mice spleen by flow cytometry, were investigated. Results: DCs isolated from 18α-GA-treated mice expressed lower levels of CD40 (p < 0.05) and MHC II (p < 0.01) compared to those of control group. In MLR assay isolated DCs decreased T cell proliferation to 83.54% ± 4.3% of control (p < 0.05). The level of IFN-γ in the MLR supernatant was declined to 25.2% ± 6.8% of control. In DTH test, DCs isolated from 18α-GA-treated mice significantly suppressed antigen-specific cell mediated immune response (3.3 ± 1 mm in test group versus 6.5 ± 1.2 mm in control group, p < 0.01). The percentage of Treg cells in spleen of 18α-GA-treated mice (6.37% ± 2.3%) was lower than that of control group (13.85% ± 0.4%, p < 0.05). Conclusions: In vivo administration of 18α-GA resulted in inhibition of DCs maturation and T cell-mediated responses, the effects that may candidate this compound for its possible benefits in immune-mediated diseases. © 2016 Taylor & Francis