

GENDER DERMATOLOGY

DIFFERENTIAL ROLE OF ESTROGEN IN SENSITIZATION AND ELICITATION PHASE OF CONTACT HYPERSENSITIVITY IN MICE

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Introduction: It has been reported there is gender difference in the development and prevalence in allergy such as allergic reactions, anaphylaxis and atopic diseases.

Objective: Effects of estrogen on contact hypersensitivity (CH) responses are controversial. This study was designated to determine the effect of estrogen on sensitization and elicitation phase and repeated induction of CH responses.

Materials and methods: CH responses were induced by 2,4,6-trinitrochlorobenzene (TNCB) or oxazolone (Oxa) in ovariectomized BALB/c mice with or without estradiol (E2).

Results: CH response with TNCB but not Oxa, was impaired by E2. Transfer of sensitized immune cells from E2-treated mice to naive mice revealed sensitization phase with both TNCB and Oxa was enhanced by E2, which might be related with higher expression of TSLP mRNA in E2-treated mice, while transfer of sensitized immune cells from naive mice to E2-treated mice showed that elicitation phase with TNCB was impaired in mice treated with E2 for 2 wks but not 1wk before transfer. Systemic administration of IL-4 did not restored impaired CH response with TNCB, whereas IL-4 mRNA expression was apparently reduced in the skin. CH response induced by TNCB at the same site as sensitization was much weaker in E2-treated mice compared with that induced at the different site from sensitization. The cumulative CH response by repeated application of TNCB every other day for 24 days was clearly strong in ovariectomized mice compared with E2-treated mice. However, increment of CH responses after each application of TNCB was larger in E2-treated mice compared with those of control after day 16 or later, which might be related to mRNA expression of IL-13 but not IL-4 in the skin.

Conclusions: E2 has several aspects for CH responses: enhances sensitization phase, inhibits elicitation phase in some condition, skews immune responses toward type 2, and might induce tolerance.