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Effects of Thyme components on Cell-mediated immunity in ovalbumin immunized mice

Gholijani N1. PhD, Amirghofran Z. [1,2] PhD

1. Autoimmune Disease Research Center, Shiraz University of Medical Sciences, Shiraz, Iran [2]Department of Immunology and Medicinal and Natural Products Chemistry Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Introduction: Thymol and carvacrol, two main components of thyme have revealed several valuable effects on immune system. The aim of the present study was to evaluate the effects of these components on T helper cell responses and their subsets in mice immunized with ovalbumin. **Materials and Methods:** The effect of components on *in vivo* specific immune response was evaluated by delayed type hypersensitivity (DTH) and splenocyte proliferative response by Brdu assay. The gene expression of cytokines as well as key transcription factors involved in T cell subsets differentiation in mice splenocytes were examined by real time PCR. The cytokines production in splenocyte culture supernatants and in mice sera were measured by enzyme-linked immunosorbent assay (ELISA). **Results:** Treatment of mice with thymol reduced DTH response to 34.1% of untreated mice. Both components diminished splenocyte proliferation to nearly 65-72% of control ($p<0.01$). These components decreased cytokine levels of Th1 (IL-2, IFN-γ), Th2 (IL-4) and Th17 (IL-17A) subsets in both splenocytes cultures and mice sera but increased IL-10 and TGF-β. Treatment of immunized mice with components significantly reduced the gene expression of specific transcription factors of T helper subsets including T bet, GATA-3 and ROR-γc compared to untreated ovalbumin-immunized mice. **Conclusion:** Carvacrol and thymol could suppress the antigen specific immune responses by reducing the T helper cells related cytokines and specific transcription factors suggesting their potential for modulating destructive immune responses arising from T cell over-activation. **Keywords** Thymol, carvacrol, Ovalbumin immunization, immunomodulation, T helper subset

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The effect of Nigella Sativa essential oil on enhancement of the NK activity in mice with BCL-1 induced cancer

HosseiniFS[1] ,Jalali-NudooshanMR[2] ,RadjabianT[3] ,YaraeeR[4]

1. MSC of Immunology, Department of medicine, Shahed University
2. PHD of Pathology, Department of medicine, Shahed University
3. PhD of Plant Physiology, Department of Sciences, Shahed University
4. PhD of Immunology, Department of medicine, Shahed University

Introduction: *Nigella sativa* L., commonly named black seed, has long been used in traditional medicine to treat different types of cancers. In this study, the potential immune-modulatory and anti-leukemic effects of orally administered *N. sativa* essential oil (NSEO) were investigated in mice with BCL-1- induced leukaemia. **Materials and Methods:** 15 female BALB/c mice were divided into three groups (n = 5). Two groups were received 5×10^6 BCL-1 cells and treated with either NSEO (treated group) or solvent (untreated group) for 3 weeks. The third group received only NSEO (black seed control group). The blood leukocytes were counted in blood smear. NK activity in splenocytes against YAC-1tumor cells was assessed by LDH release assay. **Results:** It was demonstrated that the volatile oil of *N. sativa* significantly enhanced NK activity in treated group at both 5:1and 10:1 E:T ratio ($P < 0.05$).The results showed that the percent of lymphocytes in untreated group significantly augmented compared to two other groups and treatment with NSEO decreased the number of cancer lymphocytes in peripheral blood. **Conclusion:** The results of the current study indicated that part of anticancer mechanism of NSEO in vivo could be attributed to its effect on NK activity and it could be considered as a promising agent for the treatment of cancers.