

Summary of the Ph.D thesis No., **26077** . Faculty of Veterinary Medicine, Urmia University.

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Title: The effects piperine on Experimental autoimmune uveitis

Summary:

Although the anti-inflammatory and immunomodulatory effects of piperine have been mentioned in past studies, but there is no evidence about the role of piperine in ameliorating experimental model of autoimmune uveitis (EAU). EAU induced in Lewis rats by immunization with interphotoreceptor retinoid-binding peptide (IRBP) emulsified in complete Freund adjuvant. Treatment groups daily received piperine (20, 40 and 80 mg/kg-p.o.) or prednisolone (2 mg/kg-p.o.) from day 8 post immunization when the animals developed the first signs of uveitis and continued throughout the investigation until the day18 when rats were sacrificed. Clinical and histopathological findings represented severe intraocular inflammation and significant weight loss in the immunized rat. All treatment protocols were successful in reducing clinical symptoms and leukocyte infiltration into the retina. Piperine at a dose of 80 mg/kg was as effective as prednisolone in reducing the mean clinical score, histopathological changes and Indoleamine 2,3-dioxygenase activity in the eyes. In terms of improving weight gain, piperine worked better than prednisolone. In terms of improving weight gain, 80 mg/kg piperine worked better than prednisolone. Nevertheless, prednisolone performed better in reducing nitric oxide levels in the eyes of EAU rats than other groups. A decrease in the level of malondialdehyde (MDA) was seen in the treatment groups. The mRNA expression of IL-10 and TGF- β in the eyes of EAU rats received 80 mg/kg piperine was significantly mounted more favorable than other treatment groups. The ratios of T-bet/GATA-3, ROR γ c/T-bet, T-bet/Foxp3, RoR γ c/Foxp3, T-bet/GATA-3, and ROR γ c/GATA-3 expression represented a further decrease in the EAU rats treated with 80 mg/kg piperine or prednisolone compared to other groups. Ex vivo stimulation of splenocytes from EAU rats treated with piperine or prednisolone showed a significant IRBP-specific proliferation compared to splenocytes from un-treated animals. Oral administration of piperine shows beneficial effects in alleviating the EAU and piperine may be a potential clinical application in uveitis.

Key words: autoimmunity, experimental uveitis, piperine, prednisolone