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## A case-series on Levamisole toxicity in five mixed German shepherd dogs in Tehran

**Nekouie Jahromi OA, Aldavood SJ, Akbarein H, Boluki Z, Ghazaleh N**

*Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran (omid\_nekouie3@yahoo.com)*

Levamisole is widely used as an anthelmintic and has a broad spectrum activity against GI helminthes and lungworms. Levamisole acts as a cholinergic agonist, leading to neuromuscular paralysis of the parasites. This drug caused toxicosis following an acute oral dose of 12 mg/kg in dogs. The margin of safety may be narrow and no antidote is available. Levamisole has also cardiac side effects and toxic dose is around 10-times more than its therapeutic dosages. In the spring of 2006, five male mixed-German shepherd dogs which holding in a factory as guard dogs, around Tehran, were referred to a private veterinary clinic in Tehran for routine check-up (complete clinical examinations, vaccination, and antiparasitic treatment). Levamisole as a broad spectrum anthelmint was administered with wrong dosage (80 mg/kg). The day after, the owner referred his dogs, again, with the following signs (respectively): vomiting, diarrhea, tachypnea, bradycardia, excitement, depression, and finally recumbency. In ECG, premature atrial contractions and premature ventricular contractions were seen and eventually, ventricular fibrillation led to their death. In necropsy, their lungs and intestines were congested and trachea was full of saliva and other fluids. At last, according to the history, clinical and pathological findings, levamisole intoxication was confirmed.

**Keywords:** Levamisole, toxicity, dog, mixed German shepherd.

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## Study of watery extract efficacy of *Echinacea purpourea* on rat immune system

**Mohmmadpour A, Ghavami S, Sadigh Eteghad S**

*Young Researchers Club, Azad University of Tabriz, Tabriz, Iran (ghavami.siavash@gmail.com)*

**Introduction & aim:** Immune system Conflicted by strange ingredient thus microorganisms as bacteria, microbes and extraneous ingredient as toxic compound. Immune stimulation is one of important problems for researchers & pharmacognosic studies shown that *Echinacea Purpourea* has immune stimulant effect on same laboratory animals. The aim of this study is scrutiny of *Echinacea Purpourea* watery extract efficacy on rat mice immune system stimulation. **Methods:** In this study we used of 20 males rat mice (n=10 for each group). First group received physiologic serum and in another group used of watery extract of *Echinacea Purpourea* in 500 mg/kg dosage during 3 weeks, orally. In next step after blood sampling and purring them serum, laboratory analyses included, Hematocrit, WBC, differential white blood cell count, phagocyte activity (number), total protean, albumin and gamma globulin is done. **Results:** Result shown that, in watery extract group into the physiologic serum group has significant increasing in differential white blood cell count and gamma globulin level ( $p<0.001$ ), the number of lymphocytes and phagocyte activity have significant increasing too ( $p<0.05$ ). But in hematocrit, total protein and albumin level not significant changes seen. **Discussion:** Watery extract of *Echinacea Purpourea* has immune stimulant effect in Rat and this effect probably acting via increasing lymphocyte number and phagocytosis and gamma globulin level in blood.

**Keywords:** Immune system, *Echinacea purpourea*, Rat