



## 690) Effects of intrathecal administration of vitamin K2 on formalin induced plantar inflammatory edema in rats

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**Background and Aim:** Menaquinone-4, a derivative of vitamin K is synthesized by intestinal bacteria and in many studies the presence of vitamin K2 (Menaquinone-4) with important functions in the brain at high concentrations has been demonstrated. This vitamin is capable to inhibit many inflammatory mediators in different diseases. Therefore, the purpose of this study is to find the effect of vitamin K2 in reduction or inhibition of inflammation and paw edema induced by formalin injection.

**Methods:** Male adult Wistar rats (250-300 g) were subjected to intrathecal (i.t) surgery in which an 8cm polyethylene cannula (gauge 10) was inserted into the spinal subarachnoid space. Group includes: control (normal, not handled) sham (saline + DMSO, i.t) and experimental received vitamin K2 in 3 groups (2, 10 and 20  $\mu\text{g}/10\mu\text{l}$ , i.t). Before and 60 minute after the injection of formalin (2.5%) in to the right hind paw of rats, paw volume was measured using plethysmometer method.

**Results:** Vitamin K2 diminished paw edema at lower concentrations in comparison to control and sham groups ( $P < 0.001$ ). Also in experimental groups, rats which received 2  $\mu\text{g}/10\mu\text{l}$  of K2, showed more potent anti-inflammatory effect ( $P < 0.001$ ) in comparison to other (10 and 20  $\mu\text{g}/10\mu\text{l}$ ) groups ( $P < 0.01$ ).

**Conclusion:** Previous researches claimed that vitamin K2 may effect on inflammation via reducing and sometimes inhibition of the activity of COX-2 and synthesis of prostaglandin E2, reducing free radicals, such as ROS and NO and inhibition of NF- $\kappa$ B signaling pathway and can reduce the release of inflammatory and pro inflammatory substances in peripheral organs and CNS. Our results confirms such anti-inflammatory effects of vitamin K2.

**Keywords:** Vitamin K2, Menaquinone-4, Intrathecal injection, Edema, Inflammation