PLoS One. 2015 Mar 20;10(3):e0121470. doi: 10.1371/journal.pone.0121470. eCollection 2015.

A Comparison of the Effects of Estrogen and Cimicifuga racemosa on the Lacrimal Gland and Submandibular Gland in Ovariectomized Rats.

Da Y[1], Niu K[1], Wang K[2], Cui G[3], Wang W[2], Jin B[2], Sun Y[4], Jia J[1], Qin L[2], Bai W[4].

Author information

Abstract

This study aims to observe the **effects** of estradiol and **Cimicifuga racemosa** on the **lacrimal gland** and **submandibular gland** of **ovariectomized rats**. We randomly divided 20 adult female SD **rats** into four groups-a sham-operated group (SHAM), **ovariectomized** (OVX) group, **ovariectomized** group treated with estradiol (OVX+ E), and **ovariectomized** group treated with the isopropanolic extract of **Cimicifuga racemosa** (OVX+ iCR). The SHAM group and OVX group used distilled water to instead the drugs. Two weeks after ovariectomy, the estradiol and iCR were administered for 4 weeks. Next, we used H&E staining and electron microscopy to observe any histological changes in the **lacrimal** and **submandibular** glands and immunohistochemical staining to observe the expressions of cleaved caspase-3 (Casp-3) and Cu-Zn SOD (superoxide dismutase). The H&E staining find that both drugs can prevent the cells of area from shrinkage in the two kinds of **gland**. But under the electron microscopy, estradiol and iCR have different efficacy. Estradiol is more effective at protecting mitochondria in **lacrimal gland** acinar cells than iCR, and iCR is more effective at suppressing endoplasmic reticulum expansion than estradiol. Both estradiol and iCR have a similar protective function on mitochondria in the **submandibular gland**. The protective function of the two glands may inhibit apoptosis by suppressing the expression of Casp-3. In addition, iCR increases the expression of Cu-Zn SOD in duct system of **submandibular gland**. The results suggest that both estradiol and iCR confer a protective effect on the **lacrimal** and **submandibular** glands of **ovariectomized rats** via different mechanisms.

PMID: 25793872 [PubMed - in process]