Rheumatol Int. 2013 May;33(5):1223-7. doi: 10.1007/s00296-012-2529-7. Epub 2012 Oct 2.

The effect of intra-articular injection of different concentrations of ozone on the level of TNF-α, TNF-R1, and TNF-R2 in rats with rheumatoid arthritis

Huiqiang Chen [1], Bin Yu, Changhuai Lu, Qingrong Lin

Affiliations

PMID: 23052485 DOI: 10.1007/s00296-012-2529-7

Abstract

The objectives of this study were to observe the therapeutic effect of ozone (O3) of different concentrations on rat with rheumatoid arthritis (RA), and to investigate the role of O3 in regulating the level of TNF-α (tumor necrosis factor), TNF-R1 (tumor necrosis factor receptor 1), and TNF-R2. Forty-eight Wistar rats were randomly divided into eight groups. There are five O3 groups which were marked by 10, 20, 30, 40, and 50 μg/mL, respectively, control group, oxygen group, and RA model group. RA was induced in all rats by hypodermic injection of collagen II and complete Freund's adjuvant except that in the control group. At 21 days after modeling, the rats in oxygen group were given an injection of oxygen in the knee joint weekly for 3 weeks, and the rats in O3 groups were injected the concentration of O3 as they marked weekly for 3 weeks. The thickness of hind paw, as well as the serum and synovial levels of TNF-α, TNF-R1, and TNF-R2 was observed. At the end of treatments, the thickness of the hind paws in O3-40 group is much less compared to RA group ($P < 0.01$). The serum levels of TNF-α, TNF-R1, and TNF-R2 showed no significant difference among all the groups ($P > 0.05$). However, the synovial levels of TNF-α and TNF-R2 in O3-40 and O3-50 groups are lower than those in RA group ($P < 0.01$). The synovial level of TNF-R1 in O3-40 group is higher than that in RA group ($P < 0.05$). In conclusion, intra-articular injection of O3 at 40 μg/mL can effectively suppress the joint swelling caused by RA. This mechanism is probably mediated by down-regulating synovial TNF-α and TNF-R2 and up-regulating TNF-R1 in the joint.

Related information

LinkOut - more resources