25TH NATIONAL & 11TH INTERNATIONAL ANNUAL CONGRESS
ON RESEARCH AND TECHNOLOGY OF IRANIAN MEDICAL SCIENCES STUDENTS
URMIA UNIVERSITY OF MEDICAL SCIENCES, URMIA, IRAN

Effects of Peritoneal Lavage with Rheum Turkestanicum Rhizome Hydroalcoholic Extract on Post-Operation-Induced Peritoneal Adhesion in Rats

Abtin Zare Hoseini[1], Vahid Reza Askari[2*]

[1]Student Research Committee, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
[2]Pharmacological Research Center of Medicinal Plants, Mashhad University of Medical Sciences, Mashhad, Iran

OPEN ACCESS

***Corresponding Author:**
Pharmacological Research Center of Medicinal Plants, Mashhad University of Medical Sciences, Mashhad, Iran

Citation:
Zare Hoseini A, Askari V R. Effects of Peritoneal Lavage with Rheum Turkestanicum Rhizome Hydroalcoholic Extract on Post-Operation-Induced Peritoneal Adhesion in Rats. *Iranian biomedical journal* 2024; 28(7): 163.

ABSTRACT

Introduction: Peritoneal adhesions are formed as a natural part of the body's healing process after surgery. The term "adhesion" is used when the scar extends from one tissue to another, typically across a virtual space such as the abdominal cavity. During this process, the body deposits fibrin on the injured tissue. Fibrin acts like glue, sealing damage and injury, and creates primary adhesion, which at this stage is called fibrosis. This research investigated the effects of rhizome, based on its anti-inflammatory and antioxidant properties, on intraperitoneal adhesion following surgery.

Methods and Materials: A 70% hydroalcoholic rhizome extract was initially prepared using the soaking process. Thirty male Wistar rats, weighing between 223 to 290 g, were divided into five groups (n = 6): (1) regular group (underwent surgery without washing and adhesion), (2) control group (underwent surgery with adhesion and washing with carrier solution), and (3, 4, and 5) groups treated with 3 mL of rhizome hydroalcoholic extract at a concentration of 0.25%, 0.5%, and 0.1% by weight/volume, respectively. The rats had adhesions induced on one side of the cecum using the sanding method. Subsequently, macroscopic examination of adhesion, scoring, and analysis of inflammatory and fibrinolytic factors in the peritoneum were conducted. The peritoneal concentrations of tumor necrosis factor alpha (TNF-α; a measure of inflammation), transforming growth factor beta (TGF-β; a measure of fibrosis), and Vascular endothelial growth factor (VEGF; a measure of angiogenesis) were measured in the peritoneal lavage fluid.

Results: The study revealed that the rate of peritoneal adhesion in the control group increased significantly compared to the standard group. Additionally, the cytokines TNF-α, TGF-β1, and VEGF levels in the control group were significantly higher than in the standard group (p = 0.0001). The group receiving rhizome extract showed improvements in all these parameters compared to the control group. Specifically, the amount of adhesion and the levels of cytokines TNF-α, TGF-β1, and VEGF in the extract-treated group decreased significantly compared to the control group (p = 0.0001 for TNF-α and VEGF; p = 0.001 for TGF-β1).

Conclusion and Discussion: The findings of our study suggest that rhizome, with its anti-inflammatory properties, can effectively prevent peritoneal adhesions in the peritoneal area.

Keywords: Fibrosis, Inflammation, Rhizome