Assessment of anti-inflammatory activity of homeopathic Arnica montana

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Background: A homeopathic dilution of Arnica montana has been used for several years in traditional medicine to treat hematomas, contusions, sprains, rheumatic diseases, and superficial inflammations of the skin. However, its biological activity has not been sufficiently well-proven.

Therefore to provide scientific evidence we performed two studies to investigate the anti-inflammatory effect of Arnica Montana dilutions. We have used 2 models: in-vitro model Human umbilical vein endothelial cells (HUVECs) and in-vivo model skeletal muscle regeneration.

Aims: The aim of the in-vitro model was to measure the effect of Arnica montana 5 cH on the expression of intracellular cell adhesion molecule (ICAM-1) in HUVECs. Intercellular adhesion molecule-1 (ICAM-1) plays an important role in the inflammatory process and immune response. Whereas the aim of in-vivo model was to investigate the potential effect of different Arnica montana dilutions on regenerating skeletal muscles and inflammatory parameters.

Methodology: For the first study, in-vitro model consisted of incubate HUVECs confluent monolayers for 1 hour with Arnica montana 5 cH in cell culture dishes and co-incubated with TNFalpha (5 ng/mL) for 16 hours at 37°C to activated human umbilical vein endothelium cells (HUVECs). After treatment, the cells were fixed with paraformaldehyde, and labelled by adding anti-ICAM-1 monoclonal antibodies. Cells were examined under a fluorescence laser scanning confocal microscope. The expression of intracellular cell adhesion molecule (ICAM-1) was quantified by Biovays ImagePro (BIP) software.

The second model consisted of crush the Extensor digitorum longus (EDL) muscles of rats in blind on groups of 7 animals which received a daily treatment by IP injections of homeopathic dilutions of Arnica montana 3 xH, 9 cH or placebo. At day 8 post injury, EDL muscles were analyzed according to different parameters including assessments of structure of injured skeletal muscles, immunolabeled pro-(M1) and anti-(M2) inflammatory macrophages and vascular CD31+ cells using a computerized image analysis.

Results: On one hand, Arnica montana 5 cH attenuated significantly ICAM-1 expression in endothelial cells compared to placebo. This suggested that Arnica 5 cH has anti-inflammatory properties in the vasculature which contributes to modulate in reperfusion injury inflammation and vascular disease.

On the other hand, the in-vivo study didn’t show significant amelioration of the amount of CD31+ cells and of histological aspect of regenerating muscles with Arnica montana 9 cH. However, this treatment significantly increased M2/M1 macrophages ratio compared to placebo.

Conclusion: These results provide evidence that Arnica montana dilution may have a positive effect on vascular cells and skeletal muscle repair through a modulation of inflammation.

keywords: Arnica montana, anti-inflammatory effect, HUVEC, ICAM-1, Extensor digitorum longus (EDL).
References:


