

The effect of aqueous extract of Aloe Vera on Acetylcholine transferase expression after spinal cord compression injury in adult rats

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Background and Objective: Increases of accidents and trauma to spinal cord injuries (SCI) often cause disability in people, especially young adults. Despite current conventional supportive treatments for SCI, a wide horizon of cell therapy and pharmacological approaches are ahead. Due to the high cost of these treatments, the design of alternative therapies like usage of herbs with pharmacological properties looks ideal. The studies identified that one of these plants, Aloe Vera, has neurotrophic and neuroprotective properties. This study was conducted to further research the effect of this plant on the SCI of adult rats.

Materials and Methods: In this experimental investigation, 24 adult male rats were divided randomly into 4 groups: 1 - laminectomy and intraperitoneal injection of saline, 2 - laminectomy and intraperitoneal injection of aqueous extracts of Aloe Vera, 3 - laminectomy and induction of spinal mechanical pressure with intraperitoneal injection of aqueous extract of Aloe Vera 4 - Laminectomy and induction of spinal mechanical pressure with saline injected intraperitoneally. After 4 weeks of daily intraperitoneal injection, the rats were killed. Morphometric study and spinal motor neurons count was performed using Kresyl Fast Violet staining and the enzyme acetylcholine transferase evaluation of neurons was performed (based on its expression pattern, severity mild-moderate and severe) using immunohistochemical techniques. The data was tested with Tukey's test and one-way ANOVA in SPSS 21 software and $P < 0/05$ was considered as significant level.

Results: Results of morphometric study showed a decline in number of spinal motor neurons in the groups with mechanical stress versus groups without stress. ($P < 0/05$) usage of aqueous extract of Aloe Vera showed a reduction in death of motor neurons. ($P < 0/05$) it also increased the enzyme acetylcholine transferase extract after the SCI. ($P < 0/001$)

Conclusion: Aloe Vera with neuroprotective effects (which might be due to its anti-inflammatory and neurotrophic properties) can reduce neuronal cell death and increased expression of the enzyme acetylcholine transferase after compression injury to the spinal cord.

Key words: Spinal cord compression injury, Aqueous extract of Aloe Vera, Acetylcholine transferase, Adult rat