Count: 359
Abstract ID: 257
subject: Neural Injuries and Neurodegenerative Disorders: Demyelinating Disorders
Presentation Type: Poster

Investigation of the effect of valproic acid on the viability and adhesion of mouse fibroblast cells on the rat decellularized sciatic nerve scaffold in-vitro

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Background and Aim : Peripheral nerve damage is one of the common disorders, and its repair is considered a major challenge in medicine. In this regard, tissue engineering researchers are trying to replace lost natural tissues using biological scaffolds. It seems that the combination of scaffolds obtained from decellularization of peripheral nerves and fibroblasts is a suitable alternative for nerve autografts to replace lost peripheral nerves. In the present study, decellularized scaffolds were prepared from the sciatic nerve of rats, and the amount of viability and adhesion of rat fibroblasts were investigated in the presence of valproic acid.

Methods : In this research, rats' sciatic nerves were sampled and tested after decellularization using Sandel's method. Control group: Rat fibroblast cell + culture medium, Negative control group: Rat fibroblast cell + culture medium + DMSO, Experimental group 1, 2, 3 and 4: Rat fibroblast cell + culture medium + concentrations of 0.625, 1.25, 2.5 and 5 µM valproic acid, Experimental group 5: Rat fibroblast cell + culture medium + sciatic nerve decellularized scaffold, Experimental group 6: Rat fibroblast cell + culture medium + sciatic nerve decellularized scaffold + DMSO and Experimental group 7, 8, 9 and 10: Rat fibroblast cell + culture medium + sciatic nerve decellularized scaffold + concentrations of 0.625, 1.25, 2.5 and 5 µM valproic acid.

Results : valproic acid in the treatment groups with concentrations of 0.625, 1.25, 2.5 and 5 ?M not only did not have positive effect on the survival, viability and adhesion of cells, but also caused a significant decrease in the amount of viability and adhesion of cells.

Conclusion : The findings of this research show that not only adding valproic acid to the culture medium has no effect on the amount of viability and adhesion of cells, but also adding scaffolds to the culture medium in the presence and absence of valproic acid has negative effects on the amount of viability and adhesion of rat fibroblasts.

Keywords : Sciatic nerve; Decellularized scaffold; Fibroblast; Valproic acid; Viability; Adhesion.