

P31. Shock waves enhance neuronal survival and improve motor function after traumatic spinal cord injury

Can Tepeköylü¹, Felix Nägele¹, Daniela Lobenwein¹, Angela An¹, Michael Graber¹, Jakob Hirsch¹, Leo Pölzl¹, Elke Kirchmair¹, Michael Grimm¹, Johannes Holfeld¹

Email: can.tepekoeylue@i-med.ac.at

1. Department of Cardiac Surgery, Medical University of Innsbruck, Austria

Introduction We hypothesized that SWT induces regeneration in traumatic spinal cord injury.

Material and Method SCI was performed in a murine contusion model in wild-type (WT) and TLR3-/- mice. Animals received 500 shock waves at 0.1mJ/mm². Functional performance of animals was evaluated. Spinal cord lesions and bladder size were quantified and evaluated via MRI. Dorsal root ganglia (DRGs) were isolated and neuronal sprouting, survival and metabolism were evaluated. Human spinal slice culture was performed.

Results SW treated animals showed significantly improved motor function and decreased neuronal degeneration. MRI revealed reduction of lesion size. SWT resulted in upregulation of angiogenic genes and modulation of inflammation. Treated animals showed a survival benefit. We found enhanced neuronal sprouting, reduced apoptosis, improved metabolism after SWT. Effects were TLR3-dependent.

Discussion SWT induces spinal cord regeneration via enhanced neuronal sprouting, reduction of apoptosis and stimulation of cell metabolism. Treated animals show improved motor function, improved vegetative symptoms and enhanced survival. All observed effects are TLR3-dependent.

Conclusion SWT could develop a potent regenerative treatment option for patients with spinal cord injury.