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19** **ABSTRACT
BOOK**

Alterations in motor neuronal calcium homeostasis after long-term treatment with blood serum from patients diagnosed with sporadic amyotrophic lateral sclerosis

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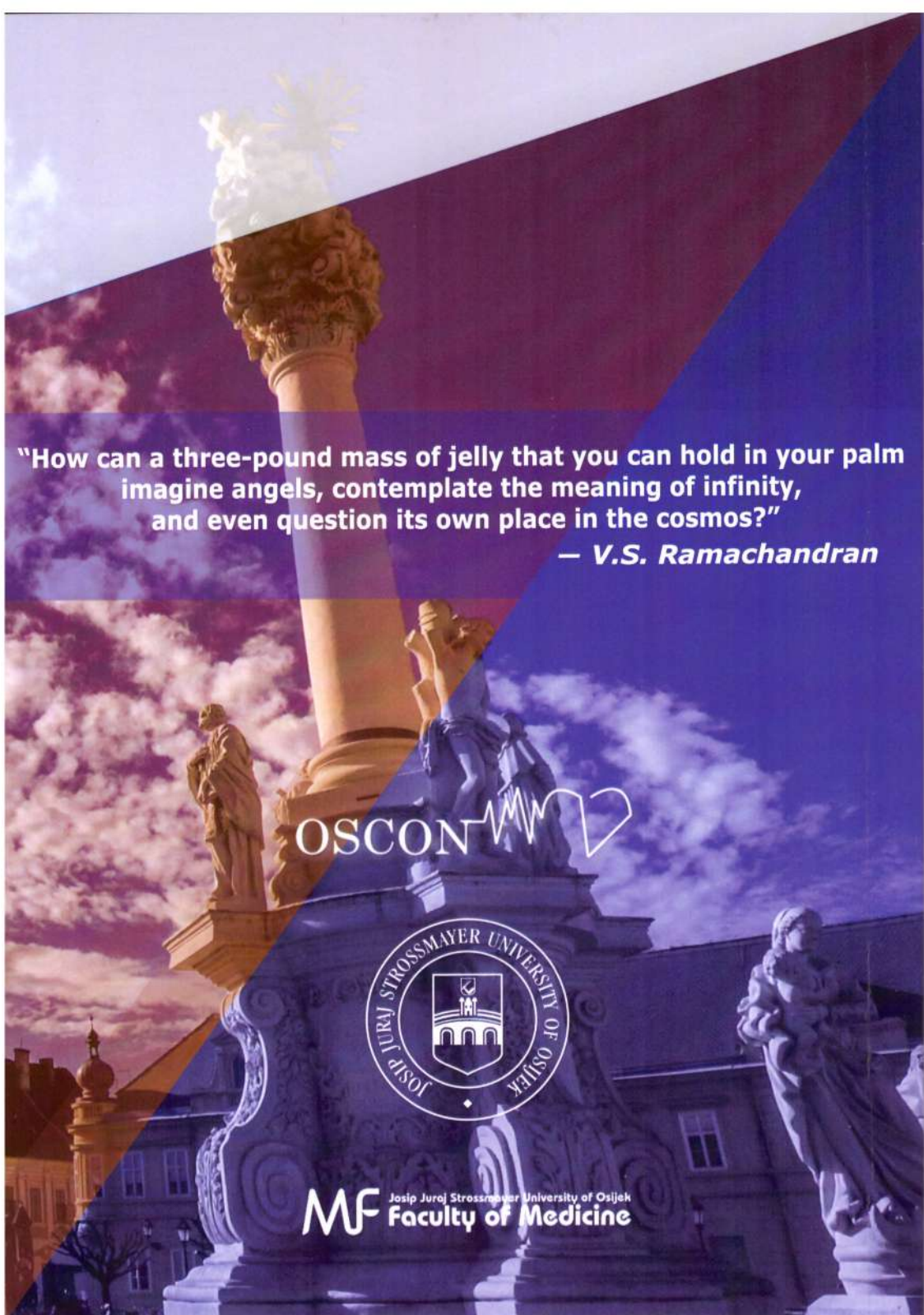
Introduction: Different pathological processes contribute to motor neuronal degeneration in the sporadic form of amyotrophic lateral sclerosis (sALS). Our aim was to understand the effect of chronic treatment with blood serum that contains anti-motoneuronal antibodies of sALS patients on the intracellular calcium level, neuronal survival and motor function.

Materials and methods: Balb/c mice were injected intraperitoneally for 75 days with blood serum from healthy individuals (n=3) and patients diagnosed with sALS (n=6). Isometric muscle strength of their limbs was measured during the passive transfer. Number of motor neurons in the spinal cord was measured with the disector method. Intracellular calcium level was quantified with geometrical statistics in the spinal cord and in the axon terminals of their *musculus interosseus* samples.

Results: Isometric muscle strength significantly decreased after long-term inoculation of blood serum from sALS patients. The number of motor neurons were also significantly decreased in the cervical ($p<0.001$) and lumbar ($p<0.001$) spinal cord. Significant increase of intracellular calcium could be documented in the cervical ($p<0.001$) and lumbar ($p<0.001$) regions of the spinal cord and in the axon terminals of their forelimb ($p<0.001$) and hindlimb ($p<0.01$). Ultrastructural alterations of perikarya and neuromuscular synapses were observed.

Conclusion: Functional regression, motor neuronal loss and elevated intracellular calcium level confirm the motor neuronal degeneration in this model. Such long-term treatment provides a feasible representation of sALS, as no genetic mutations were observed in the patients. However, it is reconcilable with the transgenic animal models widely used in pharmacotherapeutic tests. Therefore this model could be give us further understanding of motor neuronal degeneration in ALS.

Keywords: ALS; motor neuron; calcium homeostasis; stereology; electron microscopy



**"How can a three-pound mass of jelly that you can hold in your palm
imagine angels, contemplate the meaning of infinity,
and even question its own place in the cosmos?"**

— V.S. Ramachandran

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