

EFORT13-3532

Subcutaneously Administered Exenatide (a Glucagon Like Peptide-1 Analogue) On The Recovery Of Nerve In A Rat Sciatic Nerve Damage Model

E. Kuyucu^{1,*}, B. Gumus¹, O. Erbas², A. M. Dulgeroglu¹, O. A. Bora¹

¹orthopaedics and traumatology, izmir ataturk training and research hospital, ²Physiology, Ege University, izmir, Turkey

INTRODUCTION: Peripheral nerves are consisted of axonal extensions of motor neurons originating from anterior horn of medulla spinalis, sensorial neurons in dorsal ganglia, sympathetic neurons in sympathetic ganglia.(1-2) These structures are wrapped up with supportive connective tissue, and assume motor, sensorial or autonomic functions determined by target organ they terminate. Potential damage of peripheral nerves results in partial nor complete abolition of their functions. Neurotrophic factors and growth factors maintain viability of nerve cells, and also stimulate axonal growth. GLP-1 is an insulinotropic hormone secreted postprandially from endocrine L-cells of human intestines(3).

OBJECTIVES: In this experimental study, our aim is to investigate neurotrophic effects of exenatide (a GLP-1 analogue), and detect morphological, and stereological changes.

The objective of this investigation was also to keep records of stereomicroscopic findings obtained during stages of peripheral nerve regeneration

METHODS: In the control, and drug groups, sciatic nerves of the right lower extremity were cut full-thickness, and 1 cm-gap was dissected from the left sciatic nerve to form a neurotmesis model. In Group 1, the rats were given exenatide (GLP-1 analogue) 10 µg/d sc. for 12 weeks. In Group 2, subcutaneous NaCl at a dose of 0.1 ml/d for 12 weeks was applied. At 1., 3., 6., and 9. weeks sciatic nerves of one rat each from the drug, and control groups were stereomicroscopically examined, and histologically assessed after their sacrifice

RESULTS: In this study, in neurotmesis model constructed experimentally in rats, the effects of GLP-1 were investigated. Favorable effects of GLP-1 on regeneration of nerves were especially manifested in the drug group with increases in the amplitude of EMG tracings at 9. weeks, and statistically significant increases in EMG, and latencies at 12. weeks were detected ($p < 0.005$). Stereomicroscopic findings at the same weeks supported EMG recordings. Besides, at 12. weeks, statistically significant improvements in *de novo* axon formation were detected in histologic examination ($p < 0.005$). Motor tests performed at 1., and 12. weeks revealed significantly improved motor functions in the rats in the drug group ($p = 0.001$), and nervous regeneration in this group was functionally better than the control group

CONCLUSION: EMG measurements, motor tests, histologic examination have shown that GLP-1 increases myelination, and total axonal synchronization during nerve regeneration process, and enables faster nerve regeneration

Disclosure of Interest: None Declared

Keywords: Glucagon-Like Peptide 1, Nerve Regeneration, sciatic nerve, video-microscopy