

Study of the Effect of Helium Neon Laser Irradiation of Acupuncture Points to Peripheral Nerve Regeneration

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To investigate the effect of Helium-Neon Laser irradiation to human peripheral nerve regeneration, 12 New Zealand rabbits of 1500-2000gm were used. They were divided randomly into experimental and control groups. Under intravenous anesthesia, ulnar nerve was dissected out and the nerve was cut at middle 1/3 of forelimb. Its distal and proximal ends were respectively sutured to the adjacent muscle bundles to form the two ends of the muscle bridge. A longitudinally cut silicon tube of 1.5-1.8cm long, with diameter of 1.2mm was wrapped around the outside of the muscle bridge. Longitudinal cut of the silicon tube was sutured and stuck with 502 glue. On the second post-operation day the experimental group started to receive irradiation from a HN8-4 type Helium-Neon Laser therapeutic machine once a day each for 5mm, with frequency 50Hz, output wave length 632.8nm, power > 5.5mw, diameter of light spot 6mm, 2cm from the skin. The irradiation was continued for two weeks. At 4, 8, 10, 12 weeks after operation, physiological functions of the ulnar nerve were tested: the distal end of ulnar nerve was infiltrated in CB-HRP 10 μ l. After 48 hours the material was collected, frozen sections were made, stained with OD method or TMB method, and looked for time when the enzyme labeled cells appeared in the anterior horn of spinal cord at the corresponding segment of ulnar nerve and in the spinal ganglion, and their morphology and number; proximal, middle and distal segment of the areas adjacent to the ulnar nerve bridge were taken, processed for osmium acid and H&E staining, to observe the regeneration conditions of the ulnar nerve axons and myelin sheath using image quantitative analysis. The results showed that in the experimental group the increase in nerve transmission rate was slightly greater than that of the controlled group. The anterior horn of the spinal cord gradually recovered starting from the tenth week. Degeneration of the muscle fibers in the nerve muscle bridge was obvious, there were elongation of axon at the nerve cut end towards the two fiber bundles of the degenerated muscles in the muscle bridge. In C7-C8 anterior horn and spinal ganglion of the experimental group there were CB-HRP labeled cells. The diameter of regenerated axons and thickness of the myelin sheath were obviously greater than that of the controlled group. The experimental result showed that small dose of Helium-Neon Laser acupuncture point (Locus) irradiation had the effect of promoting regeneration of peripheral nerve after injuries.