COMBINED CENTRAL AND PERIPHERAL ACTIVATION OF CPG RESULTS IN EFFECTIVE RESTORATION OF LOCOMOTION IN SPINALIZED CATS.

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Recently we have shown, that the epidural stimulation of L4-L5 spinal cord segments evoke locomotorlike movements of hind limbs in decerebrated and spinalized cats. This phenomenon is connected with intraspinal CPG activation. It is known also, that the locomotor training by using forced walking movements can promote the process of restoration of locomotor of spinal cord abilities in spinalized animals. In the present study the comparative analysis of central and peripheral influences effectiveness to the restoration of the locomotor capacities of the spinal cord in chronic spinalized cats was carried out. Locomotor training was provided by special the robotic device. It was shown, that during the month period after spinalization the training of induced stepping by robotic device was not effective in restoration of the stepping. The epidural stimulation alone was not sufficient for generating of walking. Only their combination produce stepping movements. Such 2-month's combined training resulted in the possibility to initiate the stepping only by periphery input. Moreover, 3-4 month later the spinalized cat was capable to realize quadripedal waking on the treadmill belt and on the floor under body supporting. Crosscorrelation analisis of the spinal cord neurogramm and hindlimbs muscles EMG have shown, that the hindlimbs muscles reciprocness is not firmly fixed in spinalized cats spinal cord, but it is composed during waking movements, probably under the influence of afferent input. So, the combination of the central and peripheral (especially- hindlimbs pressure receptors) influences to the CPG is essential in restoration of the locomotor function.

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