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Title: Pressure-induced tremor-associated activity in ventral roots in isolated spinal cord of newborn rats

Authors: Tarasiuk, A  
Grossman, Y

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High Pressure Neurologic Syndrome

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Abstract: Hyperbaric pressure induces hyperexcitability, tremor, and convulsions in intact animals by mechanisms that are not understood. High pressure induces spontaneous electrical discharges in the spinal ventral roots which we call "tremor-associated activity" (TAA). This study examined the nature of TAA, its likely origins, and its possible contribution in the cervical roots to respiratory difficulties. Activity was recorded extracellularly from the cut cervical ventral roots C1 and C5 in an in vitro brainstem-spinal cord preparation from newborn rats. Under hyperbaric conditions spontaneous TAA was observed either between the typical respiratory bursts in C1 and C5 or immediately after the burst itself. Stimulating the trigeminal nerve at 1 Hz induced a direct excitatory medullospinal reflex which, at high pressure, was followed by a conspicuous TAA. The TAA evoked by the dorsoventral root reflex in isolated spinal cord under hyperbaric conditions was similar to that evoked by the medullospinal reflex. These findings suggest that basic TAA originates at the level of the spinal cord and may be triggered by various synaptic inputs. They further suggest that pressure-induced abnormal activity of the motoneuron pool innervating various respiratory muscles may contribute to respiratory problems encountered under hyperbaric conditions.

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