Assessment of corticodiaphragmatic pathway and pulmonary function in acute ischemic stroke patients.

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Abstract:

The aims of this study were to investigate the effect of stroke on the corticodiaphragmatic pathway and to clarify the relationships between neurophysiological data and degree of motor disability, site of infarction in CT scan, diaphragmatic excursion, blood gases and pulmonary function in stroke patients. The corticodiaphragmatic pathway was assessed using magnetic stimulation of the scalp sites and cervical roots. The study included 34 sequentially selected patients out of 250 patients with acute ischemic stroke. Twenty-five (age and sex matched) volunteers served as controls. Sixteen patients had cortical infarction, thirteen had subcortical infarction and five had both cortical and subcortical infarction. The mean Scandinavian Stroke Scale was 32.2. Decreased diaphragmatic excursion was observed in 41% of the patients. Twenty-four patients (70.5%) had abnormal magnetic evoked potentials (MEPs) of the affected hemisphere. In five patients MEPs were unelicitable from the affected hemisphere. The remaining nineteen patients had abnormal values of both cortical latency and central conduction time (CCT). Cortical latency, CCT, amplitude of compound muscle action potentials (CMAPs) and excitability threshold of the affected hemisphere were significantly altered compared to both the unaffected hemisphere and the control group. The patients with hemiplegia had a greater degree of hypoxia, hypocapnia and decreased serum bicarbonate level compared to the control group. Additionally, hemiplegic patients had a different degree of respiratory dysfunction. A statistically significant association was found between neurophysiological data and disability score, diaphragmatic excursion, site of infarction in CT scan and degree of respiratory dysfunction. Central diaphragmatic impairment may occur in acute stroke and could contribute to the occurrence of hypoxia in those patients.

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