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Neuroplasticity in Context of Motor Rehabilitation in Brain Tumor

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Abstract

B rain tumor an estimated 700,000 people in the United States, and over 87,000 more will be predictable in 2020. Multiple techniques can be used intraoperatively to help maximize the extent of resection, including stereotactic neuro-navigation with diffusion tensor-based tractography, intraoperative MRI, fluorescent tumor markers. Exercise and training rehabilitation have long been used to restore motor function after brain tumor surgery. Better training strategies and therapies to enhance the effects of these rehabilitative protocols are currently being developed for postsurgry brain tumor disability. The motor rehabilitation focused on neuroplasticity that associated with brain tumor motor impairment, and the latest experimental interventions being developed to manipulate neuroplasticity to enhance motor rehabilitation.

Keywords: Brain Tumor, Rehabilitation, Neuroplasticity

Short Communication

Nowadays, brain tumor an estimated 700,000 people in the United States, and over 87,000 more will be predictable in 2020. Also, each year, approximately 70,000-170,000 cancer patients are diagnosed with brain metastases (metastatic brain tumors/secondary brain tumors), while ~100,000 will die every year as the result of brain metastases. The incidence of brain metastases appears to be increasing. Brain tumors can be deadly, significantly impact quality of life, and change everything for a patient.

Remarkable brain tumor outcomes reported such as: Muscle weakness, Central weakness, Myopathy-related weakness, Neuropathy-related weakness, Cognitive impairments, Memory for task, Comprehension, Apraxia, Attention/Concentration, Impaired executive function, Psychomotor Delay/Delayed response time, Emotional Impairments, Depression, Anxiety, Fear of Falling, Apathy/Abulia, Abnormal Tone/Spasticity, Abnormal synergy patterns, Abnormal range of motion, Sensory Impairments, Impaired Proprioception, Impaired Perception, Numbness, Visuospatial impairments, Hemineglect, Impaired Physical vision/Hemianopia, Impairments, Pain, Fatigue, Contractures, Ataxia/Incoordination/Imbalance.

Multiple techniques can be used intraoperatively to help maximize the extent of resection, including stereotactic neuro-navigation with diffusion tensor-based tractography, intraoperative MRI, fluorescent tumor markers such as 5-aminolevulinic acid (5-ALA), and stimulation mapping of functional pathways.

Tumor location, treatment effects, and medications contribute to these deficits. Motor dysfunction has been associated with significant deterioration in health-related quality of life in people with primary and metastatic brain tumors.Resection of tumors from the motor cortex is associated with a risk of

postoperative motor deficits, but most of these deficits are transient or mild and have little functional impact, motor deficits, including

unilateral or bilateral weakness, ataxia, spasticity, and loss of complex movement execution due to multiple possible etiologies, can occur during any brain tumor illness.

The rehabilitation process is extremely recommended in brain tumor patients when compared to other malignancies because of their extremely high rate of associated disability. Similarly, preliminary results of our retrospective review have shown that approximately 30% of 200 patients being treated annually for brain tumors have postoperative neurological deficits. Patients usually receive further oncologic treatment then their functional status might worsen during additional therapy due to brain edema or tumor progression. Recent progress in the multimodal treatment of brain tumor patients has improved 5-year survival rate, which has resulted in an increased number of patients requiring rehabilitation support. Currently brain tumor is viewed as a chronic disease hence rehabilitation becomes an important aspect of care. However, despite the high incidence of neurological and functional deficits in brain tumor patients, rehabilitation treatment in this population is not as well established as it is for patients with other neurological conditions, whereas clinical guidelines suggested that rehabilitation should begin early in brain tumor patients in order to improve the recovery process and reduce disability rehabilitation is recommended in early stages of the disease for function restoration after surgery and in more advanced stages as an important part of palliative care with the aim to prevent complications, control the symptoms and maintain patients' independence and quality of life regardless of life expectancy.



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Exercise and training rehabilitation have long been used to restore motor function after brain tumor surgery. Better training strategies and therapies to enhance the effects of these rehabilitative protocols are currently being developed for postsurgry brain tumor disability. The advancement of research understanding of the neuroplastic changes associated with postsurgry brain tumor motor impairment and the innate mechanisms of repair is crucial to this endeavor. Pharmaceutical, biological and electrophysiological treatments that augment neuroplasticity are being explored to further extend the boundaries of postsurgry brain tumor rehabilitation. Potential motor rehabilitation therapies, such as stem cell therapy, exogenous tissue engineering and brain-computer interface technologies and movement therapy, could be integral in helping patients with postsurgry brain tumor regain motor control. As the methods for providing motor rehabilitation change, the primary goals of brain tumor rehabilitation will be driven by the activity and quality of life needs of individual patients. The motor rehabilitation focused on neuroplasticity that associated with brain tumor motor impairment, and the latest experimental interventions being developed to manipulate neuroplasticity to enhance motor rehabilitation.

Biography

Minoo Sharbafshaaer is an experienced Statistical Analyst with a demonstrated history of working in the mental health care industry. She is skilled in research, psychology, psychotherapy, SPSS, and mental health. She has strong research professional with a Bachelor's degree focused in Psychology from Sistan and Baluchistan University.

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