

Sleep Disorders in Patients Suffering from Brain Tumor: Letter to the Editor

Seyed Amirhossein Javadi^{1*}

Department of Neurosurgery, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran; Brain and Spinal Cord Injury Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran

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**"We are such stuff as dreams are made on;
and our little life is rounded with a sleep."**
William Shakespeare, the Tempest (1).

Brain tumor or brain surgery can cause perturbations in this integrated network and consequently, may lead to mental, behavioral, and cognitive variations. Brain tumors would cause significant morbidity and mortality. The symptoms may depend on the location or grade of tumor. Cognitive problems such as behavior, problem solving, decision making, language, and memory are among significant neurological presentations.

The treatment of brain tumor has evolved significantly during the last century. Harvey Cushing developed certain techniques to minimize the mortality of surgical procedure from 70% to 30%, in 1930s (2). The morbidity remained high until the 1960s that Professor Yashargil and colleagues developed new modalities and surgical approaches (2). However, assessment of cognitive scales revealed catastrophic outcomes in majority of patients. Sleep disorders have been neglected for longtime, though they play central role in many other cognitive functions (3, 4).

The art is long and the life short: As sleep occupies one third of our life, sleep disorders may result in serious health problems. There is a paucity of studies about sleep disorders in adult brain tumors.

Sleep-wake disturbances are among the most common disorders detected in brain tumors, particularly those undergoing radiotherapy. Difficulties in initializing or maintaining sleep, hypersomnia, somnolence or daytime sleepiness are frequent disorders (4).

Age and sex are among variables affecting sleep disorders. Higher risk of sleep disorders is reported in younger patients. Moreover, clock genes including PER1/2 and CRY 1/2 are associated with clinical presentation and recovery from sleep deficits in neurological diseases (3, 4). Environmental mechanisms also contribute to sleep disorders in brain tumors, which are categorized as direct effects of tumor, radiotherapy, medications, and neuropsychiatric aspects.

The field of neurosurgery has great contribution with sleep; not only through clinical presentation, but also considering anesthetic aspects. Awake craniotomy versus general anesthesia or asleep versus sleep procedures, are state of art in neurosurgery and challenges the traditional concepts of brain function. There are some reports that different neurosurgical approaches may create various kinds of sleep disorders, which require extensive research (5, 6).

A few guidelines exist for screening and management of sleep disorders in patients with cancer, and various assessment tools are applied. However, screening and assessment for sleep-wake disturbances in brain tumors is not a routine procedure. Cognitive behavioral therapy and medications are used for minimizing adverse effects of sleep disorders.

* **Corresponding author:** SA. Javadi, Department of Neurosurgery, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran; Brain and Spinal Cord Injury Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran
Tel: +98 912 604 9012, Fax: +98 21 66591320
Email: javadi1978@yahoo.com



Sleep disorders are well known in patients suffering from brain tumors. However, pathophysiology, patterns, treatment options, and prognosis of such disorders are not well understood in the presence of brain neoplasms.

Non-invasive brain mapping modalities such as functional magnetic resonance imaging (fMRI) and diffusion tensor imaging (DTI) tractography has provided valuable information about brain function in different anatomical area and cognitive functions of brain (7). Therefore, clinical studies considering sleep disorders could be correlated with radiological information provided by brain mapping modalities, to improve localization, diagnosis, and enhance treatment outcome.

Conflict of Interests

Authors have no conflict of interests.

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References

1. Shakespeare W. King Lear. The tempest. "Book-lovers Edition" ed. New York, NY: The University Society Inc.; 1901.
2. Ormond DR, Hadjipanayis CG. The history of neurosurgery and its relation to the development and refinement of the frontotemporal craniotomy. *Neurosurg Focus* 2014; 36: E12.
3. Armstrong TS, Gilbert MR. Practical strategies for management of fatigue and sleep disorders in people with brain tumors. *Neuro Oncol* 2012; 14(Suppl 4): iv65-72.
4. Armstrong TS, Shade MY, Breton G, et al. Sleep-wake disturbance in patients with brain tumors. *Neuro Oncol* 2017; 19: 323-35.
5. Tung A, Bergmann BM, Herrera S, et al. Recovery from sleep deprivation occurs during propofol anesthesia. *Anesthesiology* 2004; 100: 1419-26.
6. Luo M, Song B, Zhu J. Sleep disturbances after general anesthesia: Current perspectives. *Front Neurol* 2020; 11: 629.
7. Khazaie H, Veronese M, Noori K, et al. Functional reorganization in obstructive sleep apnoea and insomnia: A systematic review of the resting-state fMRI. *Neurosci Biobehav Rev* 2017; 77: 219-31.