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Optimizing post-craniotomy recovery: insights from symptom network analysis in primary brain tumor patients

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Abstract

Background: Craniotomy to remove brain tumors is an intricate procedure with multiple postoperative symptoms. However, there has been limited research on the symptom networks of these patients. To this end, this study aims to explore these symptom networks, revealing their interplay to inform better symptom control, hasten the discovery of postoperative issues, and tailor Enhanced Recovery After Surgery (ERAS) protocols, all to enhance recovery and enhance patient care.

Methods: From September 2023 to March 2024, 211 patients with primary brain tumors who underwent craniotomy at Shanghai Tongji Hospital were recruited. Their symptoms were assessed using the MDASI-BT (M.D. Anderson Symptom Inventory Brain Tumor Module) one day post-craniotomy. The symptom network of 22 symptoms was visualized using R, with central and bridge symptoms identified.

Results: Sadness (r_s=2.482) and difficulty in understanding (r_s=1.138) have the highest strength of all symptoms, indicating they are the central symptoms. Sadness (r_b=2.155) and loss of appetite (r_b=1.828) have the highest value of betweenness, indicating they are the bridge symptoms. Strong correlations were found between difficulty in understanding and difficulty in speaking (r = 0.701), distress and sadness (r = 0.666), fatigue and lethargy (r = 0.632), and nausea and vomiting (r = 0.601). Subgroup analysis revealed that noninvasive tumor patients exhibited similar symptom networks to the overall cohort, whereas invasive tumor patients showed weak symptom connections, resulting in no discernible network.

Conclusion: This study underscores the importance of understanding symptom networks in brain tumor patients post-craniotomy, highlighting key symptom interrelationships. These insights can guide more effective symptom management, early complication detection, and optimization of ERAS protocols, ultimately enhancing recovery and patient care.

Keywords: Brain tumor; Craniotomy; Postoperative; Symptom network.