Depression and Glioblastoma, Complicated Concomitant Diseases: a Systemic Review of Published Literature

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INTRODUCTION

Glioblastoma multiforme (GBM) is the most common central nervous system (CNS) malignant tumor and is a Grade IV astrocytoma according to the WHO grading system. While the gold standard for treatment of GBM remains surgical resection followed by a combination of radiation and temozolomide, many novel therapies have recently been developed for this CNS pathology. Depression is a common co-morbidity of numerous types of cancer. Depression stands as a major barrier to effective treatment as it affects treatment adherence and the doctor/patient relationship. Despite the high incidence of cancer in GBM patients, relatively little research discusses the association between GBM and depression, specifically within the context of neurosurgery.

GOAL

- Report abnormal presentations that confuse diagnosis
- Overview common developmental pathways
- Discuss drug interactions between the treatment of GBM and depression
- Describe long-term psychosocial implications of increased survival

METHODS

A search of the PubMed data base was completed using “Glioblastoma” and “Depression” as key words utilizing the PRISMA format for meta-analysis. Additional articles were added for clarification. Inclusion criteria were as follows: studies used human subjects, were written in English, discussed both GBM and depression, and the relationship between them. Articles included were categorized based on the topic considered and discussed in terms of relevance to each other and to the field as a whole.

RESULTS

A total of 85 articles were identified with 46 meeting inclusion criteria. GBM patients have higher incidence of depression compared to other cancers. Neurocognitive decline as a result of GBM is a potential source of depression. Depression significantly impacts patient care, decreasing medication compliance and patient survival. Because of neural involvement, GBM patients are often mistaken for harboring psychological or pathological diseases complicating the diagnosis. While some anti-depressants have anti-tumor properties, others have the potential to interfere with treatment of GBM. The pathophysiological development of depression and GBM share several commonalities including altered regulation of the 5-HT receptor, norepinephrine, and 3’5’-cyclic monophosphate. As treatments improve, more patients are seen at follow-up with depression, a factor that has potentially significant implications on the long term sequelae of patients with GBMs.

DISCUSSION

Depression is very common in GBM, even surpassing other cancers in terms of having a concomitant incidence frequency. Depression rates decreased following surgical resection, but should nonetheless be considered as an explanation for patients who present post-operatively with a failure to thrive. Interestingly, GBMs found involving the temporal lobe demonstrate profound decreases in quality of life and are highly associated with depression, implicating this location with more adverse presentations. Because of the neuro-involvement of GBM, depression may be the sole modality of presentation for patients with an underlying GBM. This is in part due to the numerous shared developmental and molecular pathways. Because of this, medication selection should be undertaken with great consideration as Imipramine and tranylcypromine decrease the cytotoxic effects of temozolomide on GBM. Marriage and social support are crucial in order to improve outcomes and prevent depression for GBM patients.

CONCLUSION

GBM, as the most common malignant CNS neoplasia, is not uncommon in the field of neurosurgery. Depression is a common concomitant disease that stands to greatly impact the care and long term outcomes of patients with GBMs. Awareness of the presentation, risk factors, and treatment options are central to the provision of effective care. Treatment of depression in GBM patients improves outcomes when identified and addressed appropriately. Because of this, it is in the best interest of neurosurgeons to identify and treat this when depression is seen to develop, clinically, within this patient population.