



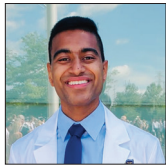
Letter to the Editor

Letter to editor regarding “Neurosurgical emergencies during pregnancy-management dilemmas”

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Dear Editor,

We recently read with great interest “Neurosurgical Emergencies during Pregnancy-management Dilemmas” by Choudhary *et al.*, who describe various neurosurgical conditions during pregnancy. In addition to their comprehensive coverage, we would like to address glioblastoma multiforme (GBM) during pregnancy.^[4] This fast-growing and aggressive tumor has occasionally been documented in pregnant patients, posing significant challenges in the neurosurgical management for both the expectant mother and fetus.^[1,7,9-12] We aim to offer further insights into the management of GBM during pregnancy, focusing specifically on the Stupp protocol.

Surgical resection is a tenant of the Stupp protocol that demands careful consideration for both mother and fetus. Intraoperative blood loss and anesthesia can induce hypotension, which increases the risk of fetal hypoxia; maintaining stable blood pressure and oxygenation is vital in protecting the developing fetus.^[10] Next, the optimal timing of surgical intervention is critical, with the second trimester being the preferred period.^[6,10,11] The first trimester is associated with an increased risk of miscarriage due to fetal vulnerability, while the third trimester is associated with intracranial hemorrhage.^[10] Moreover, the tumor’s size and edema have been shown to intensify during pregnancy, adding complexity to the surgery.^[6,12,13] A comprehensive evaluation is necessary, including factors such as gestational age, maternal and fetal physiology, and drug dynamics.^[10,12] Tracheal intubation is effective in reducing intracranial pressure during pregnancy, and general anesthesia is considered safer than epidural or spinal anesthesia.^[6] The dorsal decubitus position optimizes maternal preload, thus minimizing hemodynamic risks.^[11] Surgery should be approached with caution when the tumor is causing severe neurological stress or is associated with a poor prognosis.

Stupp protocol includes the chemotherapeutic agent temozolomide (TMZ). TMZ is an alkylating agent that can cross the placenta and damage the growing fetus, especially during the first trimester. During the first trimester, fetal malformations, developmental delay, organ damage, and growth restriction can occur with TMZ. These risks persist as the nervous system, genitalia, and blood system develop. Fetal myelosuppression, cerebral palsy, or neurodevelopmental disorders can also occur. The mother could experience sterility, spontaneous abortion, or stillbirth.^[2,3] Animal studies have demonstrated the death of the embryos and congenital malformations in response to the drug.^[6,8] In the preconception phase, TMZ carries substantial risk; some studies suggest discontinuing TMZ 6 months before conception due to the potential harm. TMZ is also not recommended during breastfeeding. Thorough discussion and careful dose calculations are crucial to ensure proper precautions and mitigate the risks before the induction of TMZ therapy.

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Radiation therapy is also included in GBM treatment. However, it poses a significant risk of teratogenesis, central nervous system malformations, growth restriction, and even fetal death.^[10] Doses > 50 cGy are harmful during all trimesters.^[2,11] Doses as low as ten cGy pose risks during sensitive stages such as organ development or early embryogenesis. A 1–2 cGy dose leads to a 1.5 times increased risk of the fetus developing leukemia, while 100 cGy doses can cause a 40% increased risk of serious mental retardation.^[5,6] A shielding method is often discussed due to the radiation scattering and hitting the fetus. Pelvic shielding can help reduce this leakage, with some studies reporting a 5% reduction in dose.^[6] The mother may experience hair loss, fatigue, nausea, vomiting, and negative skin changes as well. With microcephaly, growth abnormalities, or malignancy risks, no radiation dose can be considered entirely safe. For radiotherapy, the dosing, shielding, and exposure should be reviewed before initiating treatment.

GBM poses treatment challenges for both the fetus and the mother. Choudhary *et al.* discuss many complications that arise when treating neurosurgical challenges in the context of pregnancy; however, GBM was not specifically covered.^[4] GBM is commonly treated with surgery, TMZ, and radiation therapy, with each option presenting unique challenges. Treating GBM during pregnancy is a formidable challenge that should be approached with caution.

Ethical approval

Not applicable.

Declaration of patient consent

Patient's consent is not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the

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