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Gender differences in gliomas: From epidemiological trends to changes at the hormonal and molecular levels

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Abstract

Gender plays a crucial role in the occurrence and development of cancer, as well as in the metabolism of nutrients and energy. Men and women display significant differences in the incidence, prognosis, and treatment response across various types of cancer, including certain sex-specific tumors. It has been observed that male glioma patients have a higher incidence and worse prognosis than female patients, but there is currently a limited systematic evaluation of sex differences in gliomas. The purpose of this study is to provide an overview of the association between fluctuations in sex hormone levels and changes in their receptor expression with the incidence, progression, treatment, and prognosis of gliomas. Estrogen may have a protective effect on glioma patients, while exposure to androgens increases the risk of glioma. We also discussed the specific genetic and molecular differences between genders in terms of the malignant nature and prognosis of gliomas. Factors such as TP53, MGMT methylation status may play a crucial role. Therefore, it is essential to consider the gender of patients while treating glioma, particularly the differences at the hormonal and molecular levels. This approach can help in the adoption of an individualized treatment strategy.

Keywords: DNA methylation; Gender; Glioma; MGMT; Sex hormone.

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