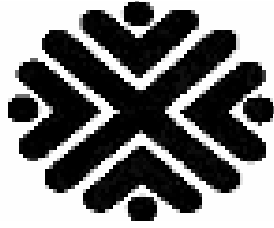


Abstract

Brain tumors are the most common cause of death after stroke due to neurologic causes. The most malignant and most lethal brain tumor is glioblastoma multiforme (GBM). GBM is one of central nervous system tumors that develops from glial brain tissue. According to the classification of World Health Organization (WHO), GBM is a grade IV astrocytoma. Astrocytoma is one of 3 distinct types of glial tumors in the brain. The incidence of glioblastoma multiforme is 4 per 100,000 people. GBM is slightly more common in men than in women; the male-to-female ratio is 3:2. GBM can occur at any age but is more common in men between 46 to 52 years than in women. The clinical course of this tumor is usually very fast, so the lifetime of these patients without any treatment is up to three months, and with treatment is 12 to 17 months.

For decades, the relationship between cancer and the Human Cytomegalovirus (HCMV) has been the subject of research, of a significant number of scientists. As yet role of HCMV in the incidence of some cancers, including of colon, breast and prostate cancers has been confirmed. HCMV may contribute to progression of glioblastoma multiforme tumor through multiple pathways. One of these pathways is PI3-K/AKT pathway, that in this study, expression of *EZH2* and *IGFBP2* genes (which are biomarkers of PI3-K/AKT pathway) in glioblastoma multiforme patients were evaluated. For this purpose, after obtaining written consent from patients, a part of their tumor was taken during surgery and then 2 process was done on these samples: 1 – Extraction of DNA from tumor and non-tumor tissue and detection of genome of HCMV virus by PCR. 2 - Extraction of RNA from tumor and non-tumor tissues, cDNA synthesis and doing Real time PCR. Finally, statistical analysis and interpretation of the data were performed. PCR results of samples showed that 12 of 16 glioblastoma multiforme samples were HCMV positive and 4 of them were HCMV negative and PCR results of non-neoplastic brain tissue samples showed that all of them were HCMV negative. Real Time PCR results showed that: 1. Expression of *IGFBP2* gene relative to *GAPDH* gene (internal control) in HCMV negative glioblastoma tissues was increased 5.486 times compared to non-neoplastic brain tissues. 2. Expression of *IGFBP2* gene relative to *GAPDH* gene in HCMV positive glioblastoma tissues was increased 15.032 times compared to non-neoplastic brain tissues. 3. Expression of *EZH2* gene relative to *GAPDH* gene in HCMV negative glioblastoma tissues was increased 6.053 times compared to non-neoplastic brain tissues. 4. Expression of *EZH2* gene relative to *GAPDH* gene in HCMV positive glioblastoma tissues was increased 41.098 times compared to non-neoplastic brain tissues. Hope that by using anti-viral treatments and vaccines can prevent progression of glioblastoma multiforme tumor and thus can help to extend the lifetime of these patients.



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Title:

**Expression profiling of *EZH2* and *IGFBP2* genes in
Glioblastoma Multiforme brain tumors in Iranian
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