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The Relationship between Carnitine Levels and Lipid Peroxidation in Glial Brain Tumors

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Abstract: Aim: It is assumed that reactive oxygen species and lipid peroxidation cause cell membrane damage and play a role in oncogenesis. Carnitine and acyl esters, which play a role in intracellular short-, medium-, and long-chain fatty acid metabolism, are one of the defense mechanisms against free radical toxicity. It is thought that the protective effects of carnitine are related with its role in lipid metabolism. In our study, we analyzed the relation between malondialdehyde (MDA) and free carnitine, and C2, C3, C4, C5, C6, C8, C10, C12, C14:1, C14, C16:1, C16, C18:1, C18, C20:4 carnitine levels in glial tumors [glioblastoma multiforme (GBM) (n = 29), high-grade astrocytoma (n = 8) and low-grade astrocytoma (n = 8)] to determine whether there is a relation between carnitine-acyl carnitines and lipid peroxidation in carcinogenesis. Materials and Methods: The present study examined the free carnitine and C2, C3, C4, C5, C6, C8, C10, C12, C14:1, C14, C16:1, C16, C18:1, C18, C20:4 levels of glial tumors in tandem mass spectrometry. We measured MDA levels using HPLC system. Results: There was a significant correlation between MDA and C20:4 carnitine levels in GBM. C20:4 carnitine levels increased with increasing MDA levels ($p = 0.000$, $r = 0.916$), but no significant correlation was found in the other groups. Conclusions: In conclusion, measurement of only carnitine-MDA relation did not reflect any significant correlation. Detailed studies, including measurement of parameters showing antioxidant status and tumor cellular metabolism, are necessary.

Key Words: Carnitine, lipid peroxidation, tandem mass spectrometry, HPLC

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