

Type of electromagnetic field therapy improves survival for patients with brain tumor

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Early research indicates that the use of tumor-treating fields, a type of electromagnetic field therapy, along with chemotherapy in patients with a brain tumor who had completed standard chemoradiation resulted in prolonged progression-free and overall survival, according to a study in the December 15 issue of *JAMA*.

Glioblastoma is the most devastating primary malignancy of the central nervous system in adults. Most patients die within 1 to 2 years of diagnosis. During the last decade, all attempts to improve the outcome for patients with glioblastoma have failed when evaluated in large randomized trials. Tumor-treating fields (TTFields) are a treatment that selectively disrupts the division of cells by delivering low-intensity, intermediate-frequency alternating electric fields via transducer arrays applied to the shaved scalp. Preclinical data have demonstrated a synergistic antitumor effect with chemotherapy and TTFields, according to background information in the article.

Roger Stupp, M.D., of University Hospital Zurich and the University of Zurich, Switzerland, and colleagues randomly assigned 695 patients with glioblastoma who, after completion of chemoradiotherapy, received maintenance treatment with either TTFields plus the chemotherapy drug temozolomide ($n = 466$) or temozolomide alone ($n = 229$). Treatment with TTFields was delivered continuously (greater than 18 hours/day) via 4 transducer arrays placed on the shaved scalp and connected to a

portable medical device. Temozolomide was given for 5 days of each 28-day cycle. The study was conducted at 83 centers in the United States, Canada, Europe, Israel, and South Korea.

The trial was terminated based on the results of a planned interim analysis, which included 210 patients randomized to TTFields plus temozolomide and 105 randomized to temozolomide alone. After a median follow-up of 38 months, the median progression-free survival was 7.1 months in the TTFields plus temozolomide group compared with 4 months in the temozolomide alone group. Median overall survival in the per-protocol population was 20.5 months in the TTFields plus temozolomide group (n = 196) and 15.6 months in the temozolomide alone group (n = 84).

The over-all incidence and severity of adverse events were similar between groups.

"In this interim analysis of 315 [patients](#) with glioblastoma who had completed standard chemoradiation therapy, adding TTFields to maintenance temozolomide chemotherapy significantly prolonged progression-free and overall survival," the authors write.

"Given the survival benefit reported in this study, it should now be a priority to understand the scientific basis for the efficacy of TTFields; achieving this may require the development of robust and widely available large animal models for glioblastoma, which do not currently exist. Perhaps most concerning, because of the study design chosen, doubts may remain as to the true efficacy of this therapy. So, if TTFields therapy fails to be adopted, will this decision be attributed to professional parochialism or to data that are not trusted? The current study provides additional important data on a novel device for the treatment of glioblastoma, but it will not completely resolve that debate."

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