

Abstract

Prospective phase II trial for recurrent high-grade gliomas with capacitive coupled low radiofrequency (LRF) hyperthermia

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Background: In spite of many new approaches the treatment of malignant gliomas is still disappointing. Concomitant radiotherapy with temozolomide could improve in a RCT median survival of pts with glioblastoma multiforme from 12.1 to 14.6 months (EORTC 26981- 22981; NCIC,3; ASCO 2004). About 20% of pts with gliomas benefit from therapy depending on genomic mutations. Deep hyperthermia with low radiofrequency capacitive coupled electrodes (LRF-DHT) at 13.56 MHz is feasible in treating pts with brain tumors (Hager ED et al., ASCO 2003,#470). 4/5 of the effective LRF-energy can induce selectively apoptosis in cancer cells instead of heat. Heat alone would be contraindicated for the treatment of tumors in the brain. Therefore, electro-hyperthermia (EHT) is also referred to this technique.

Methods: N=179 pts with highly- malignant gliomas (WHO grade III/IV at recurrence or progression) where treated with LRF-DHT after recurrence and/or progression after first-line therapy of the disease after surgery, radiotherapy and/or chemotherapy. N= 53 pts in the astrocytoma WHO grade III group and N=126 pts in the WHO grade IV group (glioblastoma multiforme), KI >50%, where analyzed in an intention-to-treat observational study. Enrollment time was from 02/2000 to 04/2007. **Results:** Complete data where collected from all pts and considered for evaluation if at least 1 cycle of LRF-DHT could be performed. The median overall survival times (MST) are listed in table 1. Longstanding complete and partial remissions could be achieved after recurrence in both groups. **Conclusions:** LRF-DHT is feasible in treating pts with highly malignant gliomas without any severe side effects. Hyperthermia with capacitive coupled electrodes may increase overall median survival time (MST) by about 6 months after recurrence and/or progression after first-line therapy. Quality of life and survival could be improved by this method. Further trials are urgently warranted.

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