

## RETROSPECTIVE CLINICAL STUDY FOR ADVANCED BRAIN-GLIOMAS BY HYPERTHERMIA TREATMENT

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### Introduction

None of the established state-of-the-art treatments in malignant primary brain tumors, especially in glioblastoma multiform (GBM), could show effective or commonly accepted curative potential until today. The present situation in the field of glioma-therapy is well summarized in one of the very recent editorial articles of JAMA<sup>1</sup>: "Where to GO from here?". Electro-hyperthermia (hyperthermia, HT) applied either alone or in combination with chemo- and/or radio-therapy is a new modality of brain-glioma (BG) treatments. This new method to treat BGs with favorable toxicity profiles shows promising preliminary results<sup>2</sup>. One of the retrospective HT-studies was presented at ASCO<sup>3</sup>, showing markedly good results.

### Objective

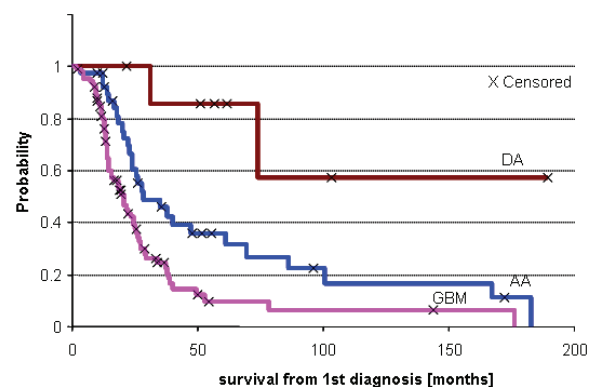
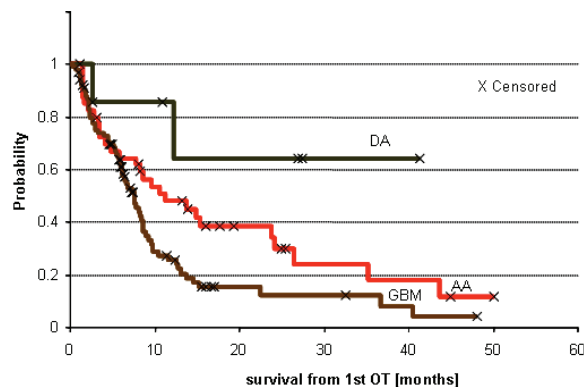
In this article is to present a retrospective clinical study for 140 BG-patients, treated/followed from February 2000 to June 2005. With this study we would like to indicate the feasibility of HT for BG. The primary endpoint was the survival time.

### Method

The study is an open-label, single arm, monocentric, retrospective study. The involved patients are being analyzed according to an intention-to-treat (ITT) schedule. Recruiting time was 56 months. The primary endpoints of the study were the overall survival time (OST) and the survival time from the first hyperthermia treatment (TST). The applied test was Kaplan-Meier log-rank (KM). HT is capacitive coupling technique by short (RF) waves of 13.56 MHz. For further details of the method published elsewhere<sup>4,5</sup>. Two/three sessions per week was performed. The average treatment numbers were 21.5 (2-108).

### Results

Distribution of the BG patients by WHO-grade show mostly advanced cases: diffuse astrocytoma, (DA): 8, (5.7 %); anaplastic astrocytoma, (AA): 40, (28.6 %); glioblastoma multiform, (GBM): 92, (65.7 %). Most of the patients failed to respond to the applied conventional therapies. Hyperthermia was applied in most of the cases in an adjuvant setting. The Kaplan-Meier (KM) plHTs are shown below.



## Conclusion

The results are well indicating the feasibility and the benefit of the hyperthermia treatment showing a valid treatment potential and safe application. Hyperthermia is a potential way to escape from the present impasse situation to treat successfully brain gliomas. Our present data are only retrospective indications of the efficacy of the hyperthermia method. A prospective, randomized, controlled double-arm clinical study is needed for an evidence-based evaluation.

## References

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- [<sup>4</sup>] Szasz A, et al: Electrohyperthermia: a new paradigm in cancer therapy, Deutsche Zeitschrift für Onkologie, 2001; 33:91-99
- [<sup>5</sup>] Szasz A, et al: An energy analysis of extracellular hyperthermia, Magneto- and electro-biology, 22 (2003) 103-115