

WHOLE BODY HYPERTHERMIA IN THE MANAGEMENT OF ADVANCED MALIGNANCIES IN CHILDREN

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Purpose. Despite the worldwide using intensive chemotherapy, surgery and/or radiotherapy in advanced cancer in children, the outcome is disappointing and there is an urgent need for novel treatment strategies in this group of patients. We used whole body hyperthermia (WBH) and cytokines as an adjuvant to chemotherapy cycles for overcoming drug resistance in this very poor prognostic group of pediatric patients.

Methods. Since 1994, 71 children (girls-37, boys-34) with a median age of 12, 5 (range 6-16) years, have been treated with chemotherapy cycles and WBH (3-4 procedures for every pts). There were 27 patients with soft tissue sarcoma, 12 – Ewing’s sarcoma, 9 –osteogenic sarcoma, 6 – renal-cell carcinoma, 5 – primary malignant hepatic tumors, 4 – germ-cell tumors, 3 – nephroblastoma and 4 – other tumors. WBH (41-43°C, 3 hours) with hyperglycemia (21-26 mmol/l) procedures induced by 13, 56 MHz EM under the general anesthesia. Besides systemic thermo-chemotherapy, patients were given cytokines: IL-2 in 12 cases, INF- α 2b in 11 cases and LAK-therapy implicated in 9 patients. In 33 pts WBH was administered as an adjuvant to standard chemotherapy (adjuvant-group). In all pts were diagnosed high risk and metastatic malignant solid tumors. WBH was used as a salvage therapy with second line chemotherapy in 38 children with resistant tumor (non-responders) or early relapses of advanced tumor (salvage-group). In case of severe hyperthermia regimens (42, 5-43°C) urotropin was used for blocking thermal proteolysis.

Results. All pts well tolerated WBH and no treatment-related complication observed. Occasionally we observed superficial skin burns which did not require any surgical management. Eight-years overall survival (OS) rate was achieved in 55% of patients in adjuvant group. These results are considerably better than at the standard therapeutic approach. As a salvage therapy WBH in 38 pts with refractory and early relapsed tumors resulted in 15% OS.

Conclusion. Based on clinical experience from many years of treatment and follow up, we suggest that whole body hyperthermia might be one of the future approaches in improving the effectiveness of care in advanced, relapsed and refractory tumors in children. Further clinical studies are necessary for optimizing temperature regimes, therapy schemes with WBH and cytokines.