

## UKRAIN AND HYPERTHERMIA TREATMENT IN A PATIENT WITH EWING'S SARCOMA (CASE REPORT)

ASCHHOFF B.

Privatklinik Villa Medica, Edenkoben, Germany.

**Summary:** A 10-year old girl with Ewing's sarcoma in the right femur was treated with Ukrain and hyperthermia. Six weeks after the first therapy series, computer tomography showed that progress of the disease had been halted. Following two more therapy series no negative changes could be detected.

### Introduction

Ukrain is a semisynthetic compound from *Chelidonium majus L.* and thiophosphoric acid triaziridide. Investigations show that it may trigger apoptosis in cancer cells while leaving normal cells unaffected (1). To date Ukrain has been used in more than 800 patients with various types of cancer. It can induce partial and complete remissions in different oncological diseases (2). In addition to its cytotoxicity, Ukrain has the effect of encapsulating the tumour (3).

The use of heat or fever as a therapeutic principle has its origin in ancient Egypt. The first treatment of a sarcoma by means of artificially induced high fever was carried out by Busch in Germany in 1866 and the first medical apparatus for the induction of local hyperthermia for the treatment of cancer was developed in 1898. It has been demon-

strated *in vitro* and *in vivo* that exposure to temperatures between 42.5 °C and 45 °C for 10-60 min can lethally damage cells (4). Various tumours treated with local hyperthermia as monotherapy showed a response rate of 50% and even complete response in 10% of cases (5). Ewing's sarcoma represents 5% of cancer incidence in children, appearing mainly between the ages of 10 and 15, in the pelvis, thigh or lower leg bones. The 5-10-year survival rate lies between 10% and 60% (6). Ukrain had previously brought about a complete remission of Ewing's sarcoma in a 9-year old girl where chemotherapy and radiotherapy had had no effect (7). Chemotherapy and sometimes amputation is the conventional method for treating this disease.

### Patient and methods

The patient, a 10-year old girl, was first diagnosed as having Ewing's sarcoma in the right femur in March 1996. She came under my treat-

---

Address for correspondence: B. Aschhoff, Privatklinik Villa Medica, Klosterstrasse 179, D-67476 Edenkoben/Weinstrasse, Germany.

ment on October 13, 1997. All therapy possibilities previously administered had had no influence on tumour growth. The tumour had shown itself to be resistant to both chemo- and radiotherapy and the patient's immune system was totally suppressed. Reports from the hospital where she had been treated wrote unanimously of the progression of the disease. She had received polychemotherapy in accordance with EICESS 92, including 2 EVAIA and 12 VAIA blocks, as well as radiotherapy up to a total dose of 54 Gy. MRI examination of the pelvic region on September 1, 1997 showed a progression of the cystic-edematous process. She was then treated with combined Ukrain and local hyperthermia therapy where tumour tissue is heated to a temperature above 42.5 °C by means of a frequency of 13.56 MHz. The first therapy series consisted of 15 mg Ukrain in an infusion with 250 ml glucose and 5 g vitamin C followed by local hyperthermia treatment. Treatment was administered every second day up to a total of 10 therapy sessions.

## Results

Six weeks after the first therapy series computer tomography showed no further tumour growth. Therapy series were repeated in February-March and June-July 1998 and subsequent examinations revealed complete remission of the tumour.

## Discussion

Treatment was extremely well-tolerated with no side effects and the quality of life for the patient gradually improved until it was possible for her to lead a normal life for a girl of her age. Although further therapy series are necessary, the results achieved so far are extremely convincing and indi-

cate that Ukrain should be used in cases of Ewing's sarcoma in children immediately after diagnosis.

## References

- (1) Liepins A., Nowicky J.W. *Selective induction of programmed cell death (apoptosis) in malignant cells by the alkaloid derivative Ukrain (NSC-613570)*. 11th Interdisc. World Cong. Antimicr. Anticancer Drugs: Future Trends Chemother., Geneva, Switzerland, 24-27 April 1994, p 93.
- (2) Nowicky J.W., et al. *Evaluation of clinical studies of Ukrain in cancer patients*. J. Chemother., 5 (Suppl.), 522, 1993.
- (3) Koshelnick Y., Moskvina E., Binder B.R., Nowicky J.W. *Ukrain (NSC-631570) inhibits angiogenic differentiation of human endothelial cells in vitro*. 17th Int. Cancer Cong. (Rio de Janeiro, 24-28 August 1998), pp 91-95.
- (4) Issels R.R., Mittlermueller J., Gerl A. et al. *Improvement of local control by regional hyperthermia combined with systemic chemotherapy (ifosfamide plus etoposide) in advanced sarcomas: Updated report on 65 patients*. J. Cancer Res. Clin. Oncol., 117, 141, 1991.
- (5) Di Palma M., Jasmin C., Nagi M., Sidi J., Tsamas A., Vannetzel J.M. *Thermotherapy in oncology*. Soins, 566, 6, 1992.
- (6) Jürgens H. *Ewing-Sarcoma*. In: S. Seeber, J. Schütte (Eds.). "Therapiekonzepte Onkologie". Springer, Berlin, 1995, p 721.
- (7) Lohninger A., Hamler F. *Chelidonium majus L. (Ukrain) in the treatment of cancer patients*. Drugs Exptl. Clin. Res., XVIII (Suppl.), 73, 1992.