Review

Hyperthermia and hypoxia: new developments in anticancer chemotherapy

Zaffaroni N.a, Fiorentini G.b, f1 and De Giorgi U.b

a Department of Experimental Oncology, National Cancer Institute of Milano

b Department of Oncology and Hematology, City Hospital, Ravenna, Italy

Received, accepted
Available online 5 March 2002.

Abstract

It has been demonstrated in vitro and in vivo that hyperthermia can enhance the cytotoxicity of some chemotherapeutic agents. The in vivo studies have demonstrated that the thermal advantage is maximized at mild temperatures such as at 40.5–43°C. Thermo-chemotherapy is widely applied in limb perfusion and intraperitoneal chemotherapy. Hypoxia in solid tumours leads to resistance to most anticancer drugs and appears to accelerate malignant progression and increase metastasis. The recent development of new drugs highly toxic to hypoxic cells may bring new strategies in anticancer treatments and move this condition from being a problem to a new tool in cancer control.

Author Keywords: hyperthermia; hypoxia; intra-arterial chemotherapy; tirapazamine

f1 Correspondence to: Giammaria Fiorentini, M.D Dipartimento di Oncologia ed Ematologia, Ospedale Civile «S. Maria delle Croci», via Randi 5, 48100 Ravenna, Italy. E-mail: g.fiorentini@iol.it; Tel/Fax: +39 544 285330