

Involvement of Reactive Oxygen Species in the Mechanisms Associated with Cervical Cancer Specific Treatment

Ș. Marinescu¹, R. Anghel¹, M.I. Gruia¹, M. Beuran²

¹“Prof. Dr. Al. Trestioreanu” Institute of Oncology, Bucharest, Romania

²Department of Surgery, Clinical Emergency Hospital, Bucharest, Romania

Abstract

Cervical cancer represents a genuine health issue in Romania. The courses of treatment applied are complex, and the accompanying biochemical mechanisms are yet to be fully understood. Thus, radiotherapy, which induces reactive oxygen species, can lead to failure of treatment in hypoxic tissues, tissues which are difficult to identify due to the small quantity in which these cytotoxic species are produced. As a result, the aim of this paper is to identify the production and role of reactive oxygen species, as well as the manner of activation of endogenous antioxidant defense mechanisms in cervical cancer patients admitted to the Oncologic Institute of Bucharest. To this purpose the biochemical parameters of oxidative stress were identified in 30 patients with cervical tumour localization, prior to surgery. The results obtained have showed that a production of reactive oxygen species is identifiable in these patients, having lipids as a primary target and leading to their peroxidation. The extension of protein oxidative degradation takes place at a much lower value, as well as the activation of endogenous antioxidant defence systems, comparing to our expectations. To conclude, we consider that when the production of active oxygen metabolites takes place in small concentrations, associated with hypoxia, the signals transmitted are towards modifying the phenotype under anaerobic conditions into one activating neovascularization, angiogenesis initiation, new cell growth and proliferation. The moment that this phase is overcome a new oxidative stress is installed, one potentially destructive for biomolecules essential to life, but also useful for further treatment, such as radiotherapy.

Key words: cervical cancer, treatment resistance, hypoxia signalling mechanisms, reactive oxygen species

Corresponding author: Șerban Marinescu, MD

“Prof. Dr. Al. Trestioreanu” Institute of Oncology, Bucharest, Romania

E-mail: serban.marinescu@yahoo.com