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Tumor is an Oxidative Stress Factor in Ovarian Cancer Patients

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Abstract

Introduction: Epithelial ovarian cancer is worldwide the second cause of gynaecological cancer but the commonest cause of gynaecological cancer-associated death.

Aim: To determine the intensity of oxidative stress in ovarian cancer patients and to establish a connection between the presence of the tumor and reactive oxygen species (ROS).

Patients and methods: Thirty-five patients diagnosed with epithelial ovarian carcinoma stage II-IV between 2010 and 2017, who underwent multimodality treatment (surgery and chemotherapy) were included in the study. ROS measured in dynamic (four determinations between every cycle) were malondialdehyde to evaluate the lipid peroxidation, ceruloplasmin, SH- albumin thiols groups and total antioxidants.

Results: There was an increase in the value of ROS: malondialdehyde mean value was 8.1 µmol/100 ml (normal value 4 µmol/100 ml); ceruloplasmin mean value was 144.8U.I. (normal value 120U.I), both showing an active oxidative process in patients with ovarian cancer. A small decrease of the value of thiols (395 vs. 450 µmol/l) and a small increase of total antioxidants was noticed (1.44 vs. 1.4 µmol). All four compounds decrease between the first determination and the fourth one. There was a strong correlation between lipid peroxides levels and ceruloplasmin (Pearson correlation 0.315 p=0.005) and between lipid peroxides and thiols groups (Pearson correlation 0.23 p=0.039). There was a correlation between thiols and antioxidants (Pearson correlation 0.33 p=0.003). Lipid peroxidation and ceruloplasmin were significantly higher in patients with residual disease (p=0.039, p=0.046) emphasizing that the tumor is a generator of oxidative stress.

Conclusion: Tumor produces ROS in excess in patients with advanced ovarian adenocarcinoma. Those ROS are corelated and acts as signalling molecules.

Key words: reactive oxygen species, ovarian adenocarcinoma