

# RELATIONSHIP BETWEEN CADMIUM AND METALLOTHIONEINS IN BREAST TUMOUR PATIENTS

**Loreta Strumylaite**, *Institute for Biomedical Research, Medical Academy, Lithuanian University of Health Sciences, Lithuania*

**Dale Baranauskiene**, *Institute for Biomedical Research, Medical Academy, Lithuanian University of Health Sciences, Lithuania*

**Rima Kregzdyte**, *Institute for Biomedical Research, Medical Academy, Lithuanian University of Health Sciences, Lithuania*

**Olegas Abdrachmanovas**, *Institute for Biomedical Research, Medical Academy, Lithuanian University of Health Sciences, Lithuania*

**Algirdas Bogusevicius**, *Department of Surgery, Medical Academy, Lithuanian University of Health Sciences, Kaunas, Lithuania*

**Background and Aims:** There is evidence that cadmium (Cd) may be related to breast cancer. Metallothioneins (MTs) are metal binding proteins that play an important role in eliminating toxic metals from the organism. The aim of the study was to assess relationship between Cd and MTs level in biological media of cancer and benign breast tumour patients.

**Methods:** Cd and MTs were determined in breast tissue and blood of 57 breast cancer and 51 benign tumour patients (controls). Two samples of breast tissue from each patient, i.e. tumour and healthy tissue were taken for the analysis. Cd was measured by atomic absorption spectrometry (Perkin-Elmer, Zeeman 3030), MTs were determined by spectrophotometry.

**Results:** Cancer patients had greater content of Cd and MTs in breast tumour tissue compare to healthy breast tissue (53.4 ng/g 95% CI 42.2–64.6 and 5.2 µg/g, 95% CI 3.6-6.7 vs. 20.1 ng/g 95% CI 14.4-25.9 and 1.7 µg/g 95% CI 1.2-2.3, respectively,  $p < 0.001$ ). In controls, there was no difference between Cd level, but MTs content was greater in tumour than in healthy breast tissue ( $p < 0.05$ ). Cd in blood of cancer patients did not differ from that in controls. However, there was significant difference between MTs level in blood of cancer patients and controls (3.0 µg/ml 95% CI 2.8-3.3 and 2.5 µg/ml 95% CI 2.2-2.7,  $p < 0.05$ ). In cancer patients, blood Cd levels and Cd in healthy and tumour tissue correlated significantly with MTs in healthy and tumour breast tissue with exception correlation between Cd and MTs in breast tumour tissue that was suggestive ( $p = 0.08$ ).

**Conclusions:** Cadmium and metallothioneins levels are greater in breast cancer than that in healthy breast tissue. Significant correlation is defined in breast cancer patients between cadmium and metallothioneins in breast tissue and blood.