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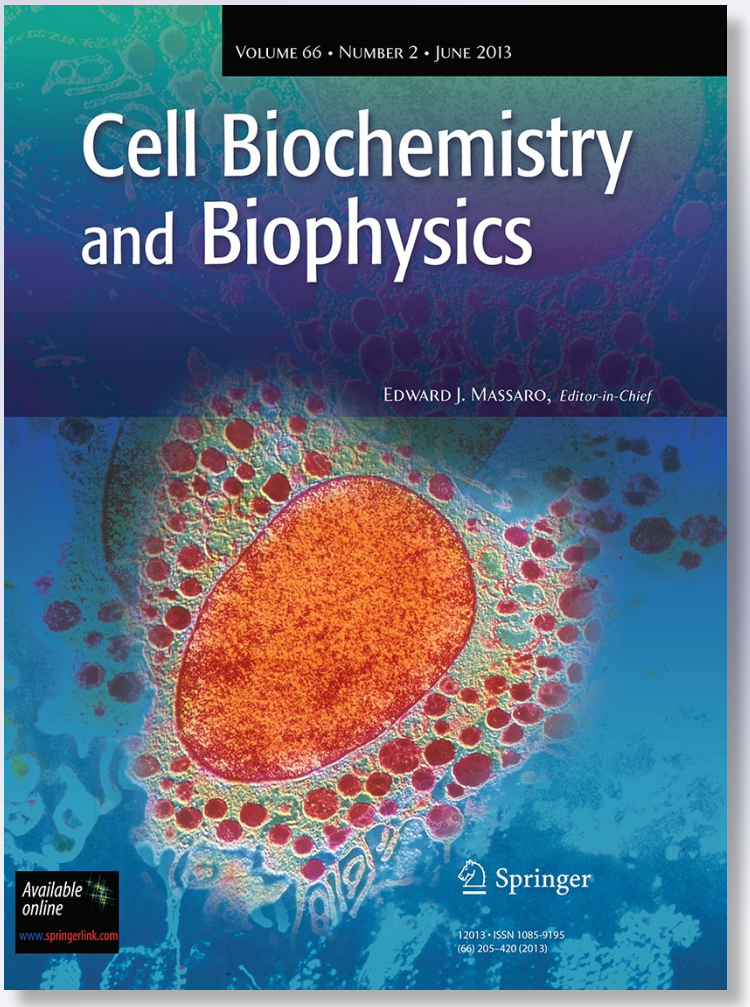

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ORIGINAL PAPER

Lactate dehydrogenase, Catalase, and Superoxide dismutase in Tumor Tissue of Breast Cancer Patients in Respect to Mammographic Findings

Sandra Radenkovic · Zorica Milosevic · Gordana Konjevic · Katarina Karadzic · Branislav Rovcanin · Marko Buta · Kristina Gopcevic · Vladimir Jurisic

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Abstract Lactate dehydrogenase (LDH), marker of anaerobic metabolism, is associated with highly invasive and metastatic breast cancer. Novel studies show that increased anaerobic metabolism (LDH), as well as activity of antioxidative enzymes (superoxide dismutase (SOD) and catalase (CAT)), is correlated with higher mammographic density, as known predictor of breast cancer risk. In this study, we measured LDH, MDH, and SOD activity in tumor and adjacent tissues of breast cancer patients by spectrophotometric assay. Mammograms were evaluated according to the American College of Radiology Breast Imaging Reporting and Data system. Mammographically dense breast tissue is associated with higher activity of LDH in tumor tissue of breast cancer patients. Moreover, patients with masses have significantly higher activity of LDH compared to patients with focal asymmetries or architectural distortion. Patients with spiculated mass margin had higher activity of LDH compared to patients with focal asymmetries or architectural distortion. Activity of LDH in patients significantly increases, while activity of CAT significantly decreases with the increase of BIRADS category. These results suggest that the association of activity of LDH and CAT in tumor tissue with mammographic characteristics could help in defining aggressive breast cancers.

Keywords Mammographic characteristics · LDH · SOD · CAT · Breast cancer

Abbreviations

LDH	Lactate dehydrogenase
SOD	Superoxide dismutase
CAT	Catalase
HER2	Human epidermal growth factor receptor 2
DAB-3	3Diaminobenzidine
ER	Estrogen receptor
PR	Progesterone receptor

Introduction

The incidence of breast cancer is increasing, but mortality is decreasing in the western countries and increasing in countries without screening [1, 2]. The use of mammography for screening has largely contributed to early detection and its use has resulted in a significant increase in the number of in situ detected cancers. Mammography is the preferred examination for breast cancer, especially in women older than 40 years, the age group with the highest

S. Radenkovic (✉) · Z. Milosevic
Department of Radiation Oncology and Diagnostics, Institute of Oncology and Radiology of Serbia, Belgrade, Serbia
e-mail: stankovics@dls.ncrc.ac.rs

Z. Milosevic · G. Konjevic · B. Rovcanin · K. Gopcevic
School of Medicine, University of Belgrade, Belgrade, Serbia

G. Konjevic
Department of Experimental Oncology, Institute of Oncology and Radiology of Serbia, Belgrade, Serbia

K. Karadzic
Department of Pathology, Institute of Oncology and Radiology of Serbia, Belgrade, Serbia

M. Buta
Surgical Oncology Clinic, Institute of Oncology and Radiology of Serbia, Belgrade, Serbia

V. Jurisic (✉)
Faculty of Medical Sciences, University of Kragujevac, P.BOX 124, 34 000 Kragujevac, Serbia
e-mail: vdvd@mailcity.com