The alteration of Lipids and Steroid Hormones in Breast Tumors

N. Kotrikadze¹, I. Nakashidze^{2,4}, L. Ramishvili¹, M. Alibegashvili¹, N. Petrovic³, T. Peshkova⁴, B. Sepiashvili¹, M. Gordeziani¹, S. Gupta⁴, M. Vanidze⁵, A. Kalandia⁵, S. Ahmad⁶.

¹Ivane Javakhishvili Tbilisi State University, Department of Biology, Tbilisi, Georgia.

²Batumi Shota Rustaveli State University, Department of Biology, Batumi, Georgia.

³Vinca Institute of Nuclear Sciences University of Belgrade, Department for Radiobiology and Molecular Genetics, Belgrade, Serbia.

⁴Batumi Shota Rustaveli State University, Department of Clinical Medicine, Batumi, Georgia.

⁵Batumi Shota Rustaveli State University, Department of Biochemistry, Batumi, Georgia.

⁶Florida Hospital Cancer Institute, Department of Gynecologic Oncology, Orlando, FL, USA

Objectives: Breast Cancer (BC) is the mostly spread malignant disease among women worldwide. Lipids play important roles in several biochemical pathways on molecular and cellular level, such as synthesis of steroid hormones, which contributes to the development of BC. Therefore, we investigated levels following plasma lipids: cholesterol (TC), high-density lipoprotein (HDL), low-density lipoprotein (LDL), very low-density lipoprotein (VLDL) and triglycerides (TG), and sex-steroid hormones: progesterone (P), estradiol (E2) and testosterone (T) in pre-menopausal (20-45 years) women with benign or malignant breast tumors.

Methods: We studied the lipid profile among the pre-menopausal (20-45 years) women with breast tumors. Venous blood samples were tested for investigation investigation. P < 0.05 was regarded as statistically significant.

Results: According to our investigation, higher CHOL level were associated with benign (P=0.0002), and malignant (P=0.0001) tumors compared with control group. The level of HDL decreases in benign (P=0.0002) and malignant (P<0.001) tumor groups compared with the control group. LDL level was elevated in both groups, as well, in benign and malignant tumors respectively (P=0.002, P<0.001). VLDL level was also decreased in both tumor subtypes respectively (P=0.0003; P=0.0007) compare to control group. Similarly, TG level was increased in benign (P=0.0025), and in malignant breast tumors (P=0.002) compared with controls. E2 and T levels were elevated in tumors in tumor's group (P<0.05).

Conclusions: Our investigation has shown the association between high levels of CHOL, LDL,TG, E2 and T with breast tumors. Lipid profile and steroid hormones may be used as relatively reliable prognostic marker for early breast cancer prevention and diagnostics

Table 1. Alteration of Lipids in Breast Tumors (Benign, Malignant).

Lipids	Control group	Benign Tumor	Malignant Tumor
Cholesterol	194±4.98	232±3.65 P=0.0002	267±8.35 P=0.0001
High-Density Lipoproteins	51.30±0.8	40.80±2.35 P=0.0002	38.40±1.28 P<0.001
Low-Density Lipoproteins	136.1±5.23	165.8±2.28 P=0.002	186.6±4.62 P<0001
Very-Low-density Lipoproteins	37.80±1.84	23.40±1.45 P=0.0003	22.2±1.24 P=0.0007
Triglycerides	142.7±2.48 1	156.6±1.53 P=0.0025	164.4±3.14 P=0.002

Fig. 1. a. E2. 1. Control group; 2. Benign Tumor.

b. E2. 1. Control group; 2. Cancer.

Fig. 2. a. T. 1. Control group; 2. Benign Tumor

b. T. 1. Control group; 2. Cancer

IGCS 2019,
Rio de Janeiro Brazil,
September 19-21, 2019