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# Hormonal status and distribution of the ABO system phenotypic groups in menopausal and postmenopausal women with breast tumors

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Breast cancer is one of the most frequent neoplastic diseases within the female population worldwide. Hormonal imbalance and the ABO system group antigens are among the numerous risk-factors which provoke the development of breast benign and malignant tumors. Here, we have investigated the following sex-steroid hormones: estradiol (E2), progesterone (P), testosterone (T)), non-sex hormones (thyroxin (fT4), thyroid-stimulating hormone (TSH) and prolactin (PRL), and the distribution of the ABO system phenotypic groups in the menopausal and postmenopausal women with breast tumors (benign, malignant). Enzyme-linked immunosorbent assay (ELISA) was used for quantitative determination of hormones. The immune-serological methods were used for investigation of the ABO system phenotypic groups. Our present investigations in menopausal and postmenopausal women with breast tumors have revealed significantly higher expression of sex-steroid hormone estradiol, but decreased progesterone, and also significantly increased testosterone levels. Thyroid gland revealed hypofunction, which confirms the decrease of thyroxin, and increase of prolactin and TSH in the blood. According to our findings, carriers of A(II) phenotypic groups showed high risk for breast tumors development in women during both stages, menopausal and postmenopausal.

**Keywords:** Breast adenocarcinoma, Cancer, Estradiol, Fibroadenoma, Prolactin, Thyroid-stimulating hormone (TSH), Thyroxin (fT4)

Breast cancer is one of the four most common causes

Steroid hormones [estrogens (estrone and estradiol)