

<https://doi.org/10.29289/259453942025V35S1080>

# Vitamin A deficiency and its association with tumor characteristics in breast cancer patients

Letícia de Barros Souto Barcelona Bernardes<sup>1</sup>, Giulia Nogueira Franca<sup>1</sup>, Alice de Aquino Tavares Fortes<sup>1</sup>, Rafael Pizaia<sup>1</sup>, Kéttlin Maely Krumenauer<sup>1</sup>, Rafaela Araceli Meireles do Carmo Lourenço<sup>1</sup>, Jenifer Katherine Peres Anschau<sup>1</sup>, Carlos Antônio da Silva Franca<sup>1,2</sup>

<sup>1</sup>Instituto de Educação Médica – Niterói (RJ), Brazil.

<sup>2</sup>Clínica de Radioterapia Ingá – Niterói (RJ), Brazil.

**Introduction:** Breast cancer is the most common cancer among women worldwide, yet there is limited literature on the effects of vitamin A in breast cancer patients. **Objective:** This study investigated the correlation between vitamin A deficiency and tumor characteristics. **Methods:** This prospective study included 50 newly diagnosed breast cancer patients who had undergone primary surgery. Universal sampling was used. The analyses were based on estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor-type 2 (HER2) status, along with vitamin A levels ( $\mu\text{g}/\text{dL}$ ). Statistical analyses included t-tests and chi-square tests. The study was approved by the research ethics committee. **Results:** The mean age was 54.6 years, standard deviation  $\pm 12.2$ , and the mean vitamin A level was  $32.2 \pm 18.1$   $\mu\text{g}/\text{L}$ . ER was positive in 76%, PR in 68%, HER2 in 8%, and triple-negative breast cancer (TNBC) in 20%. ER-positive cases had higher vitamin A levels ( $37.2$   $\mu\text{g}/\text{L}$ ) than ER-negative cases ( $16.6$   $\mu\text{g}/\text{L}$ ),  $p < 0.0001$ . PR-positive cases also had elevated vitamin A levels ( $36.9$   $\mu\text{g}/\text{L}$ ) compared to PR-negative cases ( $22.3$   $\mu\text{g}/\text{L}$ ),  $p < 0.006$ . No significant difference was found between HER2-positive ( $40.3$   $\mu\text{g}/\text{L}$ ) and HER2-negative ( $30.7$   $\mu\text{g}/\text{L}$ ) cases,  $p < 0.174$ . TNBC cases had lower vitamin A levels ( $16.8$   $\mu\text{g}/\text{L}$ ) than non-TNBC cases ( $36.1$   $\mu\text{g}/\text{L}$ ),  $p < 0.002$ . **Conclusion:** Vitamin A levels are significantly associated with breast cancer subtypes, being higher in ER- and PR-positive cases and lower in TNBC. These findings suggest vitamin A status may influence prognosis and warrant further investigation into its therapeutic role in breast cancer management.

**Keywords:** breast neoplasms; vitamin A; estrogen receptor; progesterone; triple-negative breast neoplasms.