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1012 – Cancer-related cognitive impairment in breast cancer: influence of the triple-negative subtype and therapeutic regimens

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Introduction: The cancer-related cognitive impairment (CRCI) is a relevant challenge for breast cancer survivors, with biological mechanisms still poorly understood, especially regarding the influence of tumor molecular subtypes on cerebral vulnerability. Although often attributed solely to treatment effects, recent evidence suggests that more aggressive tumors may be associated with distinct neurobiological risks.

Objective: The present study aimed to identify clinical and biological predictors of CRCI, with an emphasis on the relationship between aggressive tumor subtypes and therapeutic regimens with cerebral structural integrity.

Methodology: A systematic synthesis of studies published between 2021 and 2025 was conducted through PubMed, Biblioteca Virtual em Saúde and SciELO databases, using “Breast Neoplasms”, “Cognition Disorders” and “Neurobiology” as main descriptors. Eleven original articles were submitted to critical analysis, of which five met the eligibility criteria. The analysis prioritized neuroinflammatory pathways, microglial activation and validation of risk prediction nomograms in stratified cohorts.

Results and Discussion: The results show that CRCI results from the interaction between neuroinflammation and blood-brain barrier dysfunction. Six factors predict cognitive decline: age, schooling, tumor subtype, treatment, emotional distress and fatigue. Triple-negative breast cancer presents a higher risk of cognitive impairment, especially in young women, in whom memory complaints, fatigue and depressive symptoms are strongly associated. In addition, chemotherapy is related to a reduction of gray matter in frontal and temporal brain areas.

Conclusion: Therefore, CRCI is more pronounced in triple-negative breast cancer, indicating that cognitive decline varies according to tumor subtype. These findings reinforce the importance of early cognitive screening, especially in high-risk patients, to preserve neurological health in the long term.

Ethics: Public data.

Keywords: breast neoplasms; cognition disorders; neurobiology.