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1098 – A systematic review of the current literature on the prognostic implications of triple-negative breast cancer: its molecular aspects, metastatic patterns, and therapeutic strategies

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Introduction: Triple-negative breast cancer (TNBC) is an aggressive and biologically heterogeneous subtype defined by the absence of estrogen and progesterone receptors as well as a lack of HER2 overexpression. Representing 10–15% of cases worldwide, it is associated with rapid progression, early recurrence, and poor prognosis. Identifying molecular determinants and metastatic patterns is essential to improve clinical outcomes. This study aimed to systematically review the molecular, prognostic, and therapeutic aspects of TNBC, focusing on metastatic behavior and clinical implications.

Methods: This systematic review followed PRISMA 2020 guidelines and was registered in PROSPERO (CRD420261291744). The PICO framework included women with TNBC exposed to contemporary therapies, with outcomes related to survival, recurrence, and metastatic patterns. A search was conducted in MEDLINE, LILACS, Scopus, and Web of Science using MeSH and DeCS descriptors. Observational studies and clinical trials from the last ten years were included. Study selection was performed independently by two reviewers using Rayyan, with disagreements being solved by a third reviewer. Methodological quality was assessed using the GRADE approach.

Results: A total of 350 studies were identified, with 52 duplicates removed. After screening, 48 studies underwent full-text review, and 15 studies with moderate to high certainty of evidence were included. Biomarker changes during metastatic progression were associated with worse progression-free survival. The central nervous system was identified as a frequent site of recurrence and marker of aggressive disease. Markers such as CXCR4, pN3, and Wnt5a were linked to tumor progression and therapeutic relevance.

Conclusion: TNBC remains a highly aggressive and complex disease with limited therapeutic options. The association between metastatic patterns, particularly central nervous system involvement, and biomarker alterations highlights their role in disease progression. These findings support integrating molecular and clinical parameters into prognostic assessment and individualized therapeutic strategies.

Ethics: Not applicable – systematic review.

Registry: PROSPERO/2026 CRD420261291744.

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