

LETTER to the EDITOR

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Liquid Biopsy: A New Torchbearer in the Ever-Evolving Landscape of Breast Cancer Diagnosis

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Dear Editor

We aim to share insights into a novel screening technique known as liquid biopsy, particularly focusing on its application in the early identification of Breast Cancer. Liquid biopsy for the early detection of breast cancer is a promising and innovative diagnostic approach that offers several advantages over traditional methods. Breast cancer occurring during pregnancy (PrBC) and postpartum (PPBC) tends to be diagnosed at later stages, leading to poorer prognoses. PPBC, known for its aggressiveness and elevated risk of metastasis and mortality, necessitates effective screening methods for early detection (Baccelli I et al., 2013).

Liquid biopsies examine biological fluids like blood or cerebrospinal fluid for the presence of disease biomarkers, such as cancer exosomes, circulating tumor DNA (ctDNA), circulating cell-free nucleic acids, tumor-derived circulating tumor cells (CTCs), proteins, and phosphoproteins. Liquid biopsies hold the potential to molecularly identify tumor-associated genetic changes. Their capacity to pinpoint genetic changes linked to cancers makes the valuable tool for molecular classification of malignancies and guiding precise oncological treatments. Liquid biopsies have garnered a lot of interest due to its minimally invasive nature which can replace the requirement for an invasive, needle, or surgical tissue biopsy. Furthermore, the simplicity of data collection allows repeated longitudinal analyses, helps the monitoring of treatment response, resistance development, and minimal residual disease (MRD) detection of patient. (Lone Sn et al., 2022) There is ongoing exploration of enhancing the sensitivity and specificity of liquid biopsies to detect low-level biomarkers in the early stages of carcinogenesis. As a result, liquid biopsies are being considered as a potential screening technique for early cancer detection (Halvaei S et al., 2017).

The researchers observed that ctDNA can be found in breast milk using a liquid biopsy, and this could open up new avenues for the early detection of breast cancer in the postpartum phase. (Ana Vivancos, MD, and Cristina Saura, MD, 2023 *Cancer Discovery*). Thousands of women have been tested to confirm the efficacy of using breast milk as a novel liquid biopsy technique for the early diagnosis of breast cancer in the postpartum period (Baccelli I., 2013). As a tool for prediction of relapse or early diagnosis, its sensitivity remains limited due to the need for a large concentration of circulating tumor DNA

in the blood stream.

Finally, the ease of tolerability and convenience are a major boost for patients. As technology and research continue to advance, liquid biopsy may play an increasingly significant role in the early identification and management of breast cancer, ultimately improving patient outcomes and quality of life. Liquid biopsies hold the potential to transform the landscape of cancer care, and ongoing clinical trials will substantiate the long-term viability of this innovative technique. As our understanding of the disease and cancer biomarkers evolves, liquid biopsy is becoming an increasingly valuable tool (Lone Sn et al., 2022).

Abbreviations

1. PrBC- Breast cancer occurs during pregnancy.
2. PPBC-Ppostpartum breast cancer.
3. CTC- circulating tumour cells.
4. ctDNA- circulating tumour DNA.
5. MRD- minimal residual disease

References

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