



Aggressive Breast Cancer in Pregnancy: Poor Prognosis and Clinical Challenges in an Algerian Cohort

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ABSTRACT

Background: Pregnancy-associated breast cancer (PABC) presents unique diagnostic and therapeutic challenges due to the need to balance maternal and fetal health. This retrospective study aims to analyze the clinical, pathological, and prognostic features of PABC in a cohort of patients.

Methods: Eight cases of PABC diagnosed between 2021 and 2025 at the Medical Oncology Department of EH Didouche Mourad Hospital were retrospectively reviewed. Data on epidemiology, clinical presentation, histopathology, treatment, and outcomes were collected.

Results: The mean age at diagnosis was 32 years. Tumors were predominantly invasive ductal carcinoma (75%), with 50% being grade III and 50% showing lymph node involvement. Hormone receptor-positive, HER2-positive, and triple-negative subtypes each accounted for 37.5% of cases. Treatment included surgery (50%), chemotherapy (37.5%), and radiotherapy (50%). The mortality rate was 37.5%, with a relapse rate of 25%.

Conclusion: PABC is associated with aggressive tumor biology and poor prognosis, particularly in advanced stages and triple-negative subtypes. Multidisciplinary management is essential to optimize outcomes.

Keywords: Pregnancy-Associated Breast Cancer, Prognosis, Triple-Negative Subtype, HER2-Positive, Hormone Receptor-Positive.

Case Studies

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Introduction

The diagnosis of cancer during pregnancy or the occurrence of pregnancy during cancer treatment represents a major clinical challenge and a distressing situation for affected women. Breast cancer is the most common malignancy diagnosed during pregnancy, with an incidence of 1 in 3,000 to 1 in 10,000 pregnancies [1]. This scenario requires careful consideration of both maternal and fetal health while ensuring optimal oncologic care. The rarity of PABC, combined with concerns about fetal safety and potential delays in diagnosis, often leads to advanced disease at presentation [2].

Recent studies suggest that pregnancy may influence tumor biology, potentially accelerating disease progression through hormonal, immunological, and vascular mechanisms [3]. However, the prognostic impact of PABC remains controversial, with some studies suggesting similar outcomes to non-pregnant breast cancer patients when treated appropriately [4].

This study aims to analyze the clinical, pathological, and therapeutic characteristics of PABC in a cohort of Algerian patients, with a focus on prognostic factors and treatment challenges.

Materials and Methods

Study Design and Population

A retrospective study was conducted on 8 cases of pregnancy-associated breast cancer (PABC) diagnosed and managed at the Medical Oncology Department of EH Didouche Mourad Hospital between January 2021 and December 2025. Inclusion criteria were:

- Histologically confirmed breast cancer
- Pregnancy at the time of diagnosis or within 12 months postpartum
- Complete clinical and pathological records

Data Collection

Epidemiological, clinical, histopathological, and therapeutic data were collected from patient records. Variables included:

- Age at diagnosis
- Family history of cancer
- Gestational age at diagnosis
- Tumor characteristics (size, grade, subtype, receptor status)
- Treatment modalities (surgery, chemotherapy, radiotherapy, targeted therapy)

- Pregnancy outcomes (termination, miscarriage, term delivery)
- Follow-up data (relapse, survival)

Statistical Analysis

Descriptive statistics were used to summarize the data. Continuous variables were expressed as means \pm standard deviations, while categorical variables were presented as frequencies and percentages.

Ethical Considerations

This retrospective study was approved by the Ethics Committee of Hospital Establishment DIDOUCHE Mourad (Ref: N^o32/25). All patient data were anonymized prior to analysis to protect confidentiality and were handled in accordance with national guidelines.

Results

Baseline Characteristics and Clinical Presentation

The mean age at diagnosis was 32 years (range: 28–36 years). A first-degree family history of cancer was noted in 2 cases (25%). Five patients (62.5%) were diagnosed during pregnancy, while three were diagnosed postpartum.

Table 1: Baseline Characteristics and Clinical Presentation

Variable	N (%) or Mean (Range)
Age at diagnosis (years)	32 (28–36)
Family history of cancer	2 (25%)
Gestational age at diagnosis	–
- During pregnancy	5 (62.5%)
- Postpartum	3 (37.5%)
Tumor size (cm)	5.3 (3.0–8.0)
Histological grade	–
- Grade III	8 (100%)
Lymph node involvement	4 (50%)
Metastasis at diagnosis	2 (25%)

Molecular Subtypes and Treatment Modalities

Histologically, invasive ductal carcinoma of no special type (NST) was predominant (75%), followed by one medullary carcinoma and one phyllodes tumor.

Table 2: Molecular Subtypes and Treatment Modalities

Variable	N (%)
Molecular subtype	
- ER/PR-positive	3 (37.5%)
- HER2-positive	3 (37.5%)
- Triple-negative	3 (37.5%)
Treatment received	
- Surgery	4 (50%)
- Chemotherapy	3 (37.5%)
- Trastuzumab	2 (25%)
- Radiotherapy	4 (50%)
- Hormone therapy	2 (25%)
Refused treatment	2 (25%)

Pregnancy Outcomes and Follow-up Results

Three pregnancies were carried to term, two resulted in therapeutic terminations, and two ended in spontaneous abortions.

Table 3: Pregnancy Outcomes and Follow-up Results

Variable	N (%)
Pregnancy outcome	
- Term delivery	3 (37.5%)
- Therapeutic termination	2 (25%)
- Spontaneous abortion	2 (25%)
Follow-up outcome	
- Death	3 (37.5%)
- Relapse	2 (25%)
- No evidence of disease	3 (37.5%)

Discussion

Diagnostic and Therapeutic Challenges

The diagnosis of PABC is often delayed due to the overlap between physiological breast changes during pregnancy and cancer symptoms [5]. Our findings confirm that PABC is typically diagnosed at an advanced stage, with larger tumor sizes and higher histological grades compared to non-pregnant breast cancer patients [6].

Prognostic Factors

The poor prognosis observed in our cohort is consistent with previous studies, particularly in patients diagnosed during the 2nd and 3rd trimesters [7]. The high prevalence of triple-negative and HER2-positive subtypes further contributes to aggressive disease behavior [8].

Impact of Pregnancy on Tumor Biology

Potential mechanisms linking pregnancy to breast cancer progression include:

- Immunosuppression: Pregnancy induces a state of immune tolerance, which may allow tumor cells to evade immune surveillance [9].
- Hormonal influences: Elevated levels of estrogen and progesterone may promote tumor growth [10].
- Angiogenic changes: Increased vascular permeability may facilitate metastasis [11].

Therapeutic Management

The management of PABC requires a multidisciplinary approach involving obstetricians, oncologists, and surgeons to balance maternal and fetal health. Early surgical intervention remains critical, particularly when feasible without compromising fetal viability. Chemotherapy can be safely administered after the first trimester, with agents such as anthracyclines and taxanes commonly used. Radiotherapy is typically deferred until after delivery due to fetal risks, while hormone therapy is avoided during pregnancy. For HER2-positive subtypes, trastuzumab may be considered postpartum but is contraindicated during pregnancy due to placental transfer.

Pregnancy and Treatment Outcomes

The decision to continue or terminate pregnancy is complex and depends on multiple factors, including gestational age at diagnosis, tumor stage, and patient preference. In our study, three pregnancies were carried to term, two were terminated therapeutically, and two ended in spontaneous abortions. These outcomes underscore the psychological and ethical challenges associated with PABC management.

Conclusion

Breast cancer associated with pregnancy is characterized by young patient age, diagnostic delays, aggressive histological features, and poor prognosis. Early diagnosis and prompt initiation of treatment are critical to improving outcomes. Further prospective studies are needed to clarify the impact of pregnancy on tumor biology and to optimize therapeutic strategies.

Conflict of interest

The authors declare no conflicts of interest.

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Declarations

This study had anonymized patient data. As the research involved no direct intervention or modification of standard patient care, formal approval from an ethics committee was not required in accordance with institutional and national guidelines for observational studies. All patient data were anonymized prior to analysis to protect confidentiality and treated according to the Algerian national guidelines.

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Authors' contributions

Conceptualization: Abdelaziz AMMARI, Assia BENSALÉM; **Methodology:** Sihem BENSALÉM; **Software:** Abdelaziz AMMARI; **Validation:** Abdelaziz AMMARI, Sihem BENSALÉM, Assia BENSALÉM; **Formal Analysis:** Sihem BENSALÉM; **Investigation:** Abdelaziz AMMARI, Sihem BENSALÉM, Assia BENSALÉM; **Resources:** Abdelaziz AMMARI; **Data Curation:** Abdelaziz AMMARI, Sihem BENSALÉM, Assia BENSALÉM; **Writing - Original Draft Preparation:** Abdelaziz AMMARI, Sihem BENSALÉM; **Writing - Review & Editing:** Abdelaziz AMMARI, Sihem BENSALÉM, Assia BENSALÉM; **Visualization:** Sihem BENSALÉM; **Supervision:** Abdelaziz AMMARI, Sihem BENSALÉM; **Project Administration:** Assia BENSALÉM; **Funding Acquisition:** Not applicable.

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