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Original Research

# 5-year overall survival after early breast cancer diagnosed during pregnancy: A retrospective case-control multicentre French study☆

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**KEYWORDS**
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**Abstract** ***Background:*** Breast cancer diagnosed during pregnancy (BCP) is rare, but the prevalence is expected to rise. Long-term follow-up data regarding this clinically challenging condition are scarce. The main objective of this multicentre case-control French study was to compare the survival between pregnant patients and matched controls.
***Methods:*** Patients from 27 centres diagnosed between 2000 and 2009 with histologically proven invasive breast cancer occurring during pregnancy were retrospectively included. Controls were matched to BCP patients on age, clinical T stage, hormone receptor, HER2, administration of neo-adjuvant chemotherapy and pathological node involvement in the absence of neo-adjuvant chemotherapy. Five-year overall survival (OS), disease-free survival (DFS) and metastasis-free survival (MFS) rates were estimated using the Kaplan–Meier method.
***Results:*** One hundred and eleven BCP patients and 253 controls were included. Median age was 33 and 35 years, respectively. Both populations were managed similarly, except for less frequent sentinel node dissection ($p = 0.026$) and taxane administration ($p = 0.03$) among BCP patients. Median follow-up was 7.5 years. Survival rates were similar between both BCP and control patients: 5-year OS rates were 83.1% (95% CI: 74.5–89.0) vs 85.5% (95% CI: 80.4–89.4), respectively, $p = 0.31$; 5-year DFS rates 60.0% (95% CI: 50.1–68.6) vs 68.5% (95% CI: 62.3–73.9), respectively, $p = 0.12$ and 5-year MFS rates 71.0% (95% CI: 61.3–78.6) and 74.5% (95% CI: 68.6–79.5), respectively, $p = 0.21$.
***Conclusion:*** Our study showed that the survival outcomes of patients diagnosed with BCP were not significantly different as compared to those of matched non-pregnant controls. A proper management of women diagnosed with BCP is crucial.


## 1. Introduction

In recent years, breast cancer during pregnancy (BCP) has become an emerging issue in clinical oncology [1]. Literature data show that 0.3–3.0% of all breast cancers are diagnosed during pregnancy [2,3]. This prevalence is expected to rise due to more women choosing to have children later and the rising tendency of breast cancer incidence with age.

While older series reported that pregnancy during breast cancer was associated with worse outcomes [4], recent studies suggest that BCP patients do not have poorer prognosis [5,6].

Diagnosing breast cancer during pregnancy is clinically challenging because of the physiological changes occurring in the breast. Breast enlargement, breast engorgement and increased vascularisation make clinical and radiological examinations difficult to interpret. Furthermore, neither the physician nor the patient, who are focused on the impending new life, spontaneously mention the breast cancer diagnosis [7]. These factors may account for the delayed diagnosis among pregnant women [8,9].

In addition, for many years, pregnant patients were less frequently treated with chemotherapy and conservative surgery compared to non-pregnant patients [10].

Experts now recommend that pregnant breast cancer patients should be treated during pregnancy adhering as closely as possible to recommendations for young pregnant women and that surgery and chemotherapy are discussed with respect to delivery date [11]. Recent studies have demonstrated that conservative surgery can be performed during pregnancy and that chemotherapy is safe throughout the second and third trimesters of pregnancy [12,13]. Despite the rising incidence of BCP and the challenges it poses, long-term follow-up data are scarce. Moreover, several previously published series included heterogeneous populations consisting of both women for whom breast cancer was diagnosed during pregnancy and for whom it was diagnosed within 1 year of delivery [14]. While in the former case, treatment strategy should aim at curing the pregnant patient whereas reducing harm to the foetus as much as possible [15], in the latter there is no contraindication.

The main objective of this study was to compare the outcomes of women with BCP to those of matched non-pregnant breast cancer patients.

## 2. Patients and methods

### 2.1. Patients

We conducted a retrospective case-control study in 27 reference centres in France. Inclusion criteria for pregnant patients were histologically proven invasive breast cancer diagnosed during pregnancy and treated between 2000 and 2009. Patients with a past history of breast cancer, with metastasis at diagnosis or after delivery, or that had undergone elective or therapeutic abortion were excluded from the study.