Clinical and Histopathological Prognostic Factors and Long-Term Outcomes in Early Stage Luminal Breast Cancer: A Real-World Cohort from Brazil

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Introduction

The rising incidence of early-stage breast cancer has prompted critical discussion regarding the true benefit of adjuvant chemotherapy (ACT) in luminal tumors, a subtype characterized by favorable prognosis and high sensitivity to endocrine therapy (ET).
While multigene assays have become increasingly central to therapeutic decision-making, their limited availability in developing countries—including within private healthcare systems—represents a significant barrier. In many cases, patients must cover the high cost of testing themselves.
This highlights the pressing need to identify reliable and accessible clinicopathological markers to guide ACT decisions in resource-constrained settings.

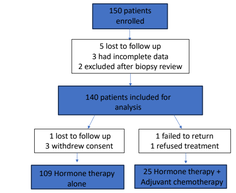


Figure 1. PRIMA diagram

Methods

We conducted a retrospective observational study using electronic medical records from a referral cancer center in Brazil. Eligible patients were women with ER-positive, HER2-negative, clinical stage I (T1N0M0) breast cancer treated between 2016 and 2024. Patients received either ET alone or in combination with ACT.

Event-free survival (EFS)—defined as time from diagnosis to recurrence or death—was evaluated using Kaplan-Meier analysis and compared using the log-rank test. Variables with p-values <0.20 were included in the multivariate analysis using the Cox proportional hazards model, with significance set at p <0.05. SPSS version 23 was used for all analyses.

Baseline Characteristics

Variable	Patients no.(%)
Age	
≤50	97(71.8)
> 50	38(28.1)
Menopausal status	
Premenopausal	41(30.8)
Posmenopausal	92(69.2)
Smoking	
Yes	30(22.6)
No	103(77.4)
Alcohol intake	
Yes	50(37.6)
No	83(62.4)
ECOG performance status	
0-1	124(92.5)
2	8(6.0)
3	2(1.5)
Body Mass Index	
<18,5	2(1.5)
18.5 – 24.9	48(35.8)
>25	84(62.7)
Biphosphonates use	
Yes	113(84.3)
No	21(15.7)

Table 1. Baseline Characteristics.

Results

In this cohort (n=134), the mean age was 59.3 years, and 69.2% of patients were postmenopausal. Most tumors were invasive ductal carcinoma (78.4%); 20.3% were histological grade 3, and 47.7% had Ki67 ≥14%. ET alone was administered to 81.3%, while 18.7% received ACT before ET, mostly with docetaxel and cyclophosphamide regime (60.0%).

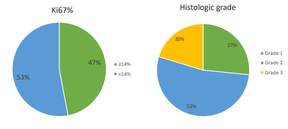


Chart 1. Ki67% data

Chart 2. Histologic grade data

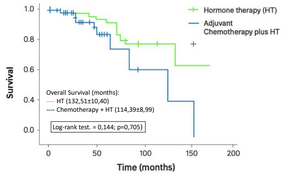


Figure 2. Overall Survival

Results

After a median follow-up of 47.3 months, no classical clinicopathological variable, such as body weight and histological grade, was independently associated with EFS. Mean EFS did not significantly differ between the ET-only group (132.5 ± 10.4 months) and the ACT group (114.4 ± 8.9 months; p = 0.705).

Univariate analysis

Variable	p-value	HR (95% CI)
Diabetes	0.361	0.496 (0.107–2.307)
Hypertension	0.834	0.871 (0.255–2.971)
Postmenopausal	0.168*	2.771 (0.605–12.684
Smoking	0.363	0.391 (0.050–3.092)
Alcohol intake	0.865	0.891 (0.230–3.453)
Hormone replacement	0.461	0.566 (0.120–2.665)
BMI	0.084*	1.171 (0.552–2.485)
Histologic type	0.026*	35.065 (26.13–50.60)
Histologic grade	0.224	1.592 (0.706–3.590)
Ki67 (%)	0.083*	3.038 (0.805–11.462)
Progesterone receptor	0.189*	33.44 (20.86–56.54)

Table 2. Univariate analysis by Kaplan-Meier method with the Log-rank test. Variables that reached a p-value <0.20 were selected for the multivariate analysis stage. In this stage, none variable remained significant in the final model.

Discussion and Conclusion

In this real-world cohort of stage I luminal breast cancer, endocrine therapy alone provided excellent long-term outcomes. The addition of adjuvant chemotherapy conferred no significant benefit, and conventional clinicopathological features lacked predictive power. These findings reinforce TNM as the most important prognostic factor among luminal breast cancer, support a de-escalation approach in selected low-risk patients, and emphasize the importance of treatment personalization, particularly in settings where molecular testing is unavailable.

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