

<https://doi.org/10.29289/25945394V36S10995>

995 – Clinical factors associated with death and recurrence in invasive breast carcinoma patients: penalized logistic regression analysis in a hospital cohort

Debora Nascimento Dias Neves¹, Juarez Antonio Sousa¹, Cayan Xavier Paula¹, Jessica Assis Bispo¹, Laura Sousa Sousa¹, Cynthia Arantes Vieira Tojeiro¹, Jefferson Dias Neves¹, Matheus Gabriel Gontijo Silva¹

¹Universidade Federal de Goiás - Goiânia (GO), Brazil.

Introduction: Identifying clinical predictors of death and recurrence in breast cancer is essential for prognostic stratification. In cohorts with few events, conventional statistical methods are inadequate, requiring penalized approaches such as Firth's regression.

Objective: To identify clinical factors associated with death and tumor recurrence in patients with invasive breast carcinoma in a private hospital cohort from Central-West Brazil, using Firth's penalized logistic regression.

Methods: A retrospective cohort study with 97 patients with confirmed invasive breast carcinoma (2 ductal carcinoma in situ cases excluded). Univariate analysis used Fisher's exact test. Firth's penalized logistic regression models were fitted for death and recurrence outcomes. A multivariable exploratory model for recurrence was adjusted for staging, axillary approach, and HER2. Discriminatory capacity was assessed by ROC curve (AUC).

Results: Six deaths (6.2%) and 9 recurrences (9.3%) were recorded. Advanced staging (III–IV) was strongly associated with death (OR=57.67; 95%CI: 9.39–643.91; $p<0.001$) and recurrence (OR=73.29; 95%CI 14.05–544.21; $p<0.001$). T3–T4 component exhibited associations of similar magnitude across both outcomes. In the multivariable model, staging III–IV maintained independent association with recurrence (adjusted OR=39.99; 95%CI 7.41–290.74; $p<0.001$). Patients with stage III–IV and T3–T4 tumors had death rates of 50% and recurrence rates of 70%. The adjusted model reached AUC=0.942.

Conclusion: Advanced clinical staging and T3–T4 component are the main determinants of adverse prognosis in invasive breast carcinoma. Firth's penalized logistic regression proved appropriate for analyzing rare outcomes in small cohorts.

Ethics: Research Ethics Committee Approval (CAAE 76523123.1.0000.5083).

Keywords: carcinoma; invasive ductal; breastbreast neoplasms; prognosis.