Analysis of the Magee 3 equation for assessing prognosis in breast cancer treatment

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Objective: In the treatment of breast cancer, along with molecular tests, tools such as Residual Cancer Burden (RCB) and Magee equations (ME) are used for prognosis. Linked to the OncotypeDX recurrence score, ME3 also predicts pathological complete response. Our objective is to evaluate the relationship of ME3 with overall survival (OS) and disease-free survival (DFS) and estimate the association between RCB and ME3. **Methodology:** This retrospective cohort study was carried out at the Cancer Institute of the State of São Paulo of the Hospital das Clínicas of the Faculty of Medicine of the University of São Paulo (ICESP/HCFMUSP) including patients with HER2-negative and HR-positive BC undergoing chemotherapy neoadjuvant treatment (NCT) from January 2011 to December 2017. OS and DFS analyses were performed using the Kaplan-Meier method and the log-rank test. ME3 scores were categorized into low (<18), intermediate (18–31), and high risk (>31). The association between these categories and the RCB categories was assessed using the chi-square test. **Results:** We enrolled 143 women (mean age: 50.3 years, range: 25–85 years). Pre-NCT, 55.2% had tumors >5 cm, and 35% had no axillary lymph node involvement (N0). The median OS time was 71.5 months, with a longer OS (43 months) observed for low ME3 values. A statistically significant association was found between ME3 and OS (HR=4.56, 95%CI 1.35–15.43, p=0.015), which was not observed for DFS (HR=2.33, 95%CI 1.06–5.13, p=0.036). Regarding RCB scores, 88.1% had moderate (RCB-II, 42.7%) or extensive (RCB-III, 45.4%) residual tumor burden. For ME3, 37.1% had a low value and 53.8% had an intermediate value. An inverse association was identified between RCB and ME3, a statistically significant relationship (χ^2=39.3215, p=0.000). **Conclusion:** ME3 demonstrated a statistically significant association with RCB and OS and could serve as an alternative to Oncotype Dx in resource-limited countries.

Keywords: breast cancer; neoadjuvant therapy; prognosis.