Treatment Cascade Disruption in Breast Cancer: Socioeconomic Predictors of Sequential Delays in a Southeast Texas Cohort

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Introduction

Timely, sequential completion of multimodal breast cancer therapy—surgery, chemotherapy, radiation, and hormone/immunotherapy—is essential for optimal outcomes. Prior studies typically evaluate delays in isolation, without assessing disruptions across the full treatment cascade. This leaves a critical gap in understanding how socioeconomic factors contribute to cumulative and sequential delays. This study evaluates predictors of multi-step treatment disruption in a diverse Southeast Texas breast cancer cohort.

Methods

We conducted a retrospective cohort study of 609 breast cancer patients treated across a Southeast Texas multi-hospital system (2018–2023). Delay was defined using modality-specific guideline windows for surgery, chemotherapy, radiation, and endocrine/immunotherapy. Patients were grouped by number of delays (0, 1, 2, 3, or ≥4). Multivariate logistic regression assessed associations between modality delays and socioeconomic and clinical variables including insurance type, age, marital status, and tumor characteristics. Subset analysis evaluated triple-negative breast cancer progression rates in relation to cumulative delays.

Results

53% of patients experienced ≥1 modality delay; 19% had ≥2 delays.

Independent predictors of cumulative delay included:

- Medicaid insurance (OR 2.89; 95% CI 1.70–4.92)
- Age <50 (OR 2.15; 95% CI 1.30–3.54)
- Unmarried status (OR 1.76; 95% CI 1.22–2.54)

In the triple-negative subset (n=98), ≥2 delays were significantly associated with higher stage progression (p=0.03).

Cascade analysis revealed the largest drop-off after surgery, where many patients failed to initiate adjuvant chemotherapy or radiation on time.

Discussion

Cumulative disruption across the breast cancer treatment cascade is strongly influenced by socioeconomic vulnerability. Medicaid insurance, younger age, and unmarried status reflect structural and social determinants that hinder timely progression through sequential treatment steps. The pronounced drop-off after surgery suggests system-level barriers in transitioning patients to adjuvant therapy. Addressing these gaps will require proactive coordination, navigator involvement, and targeted interventions for high-risk groups.

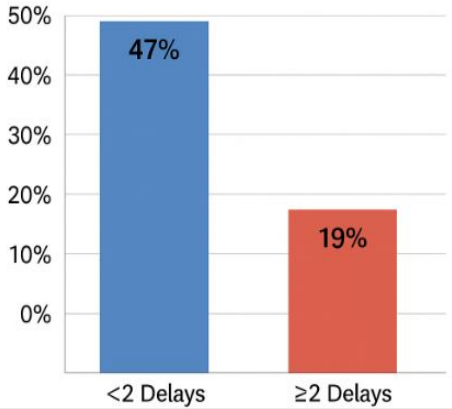
Conclusions

Cumulative disruption across the breast cancer treatment cascade is strongly influenced by socioeconomic vulnerability. Medicaid insurance, younger age, and unmarried status reflect structural and social determinants that hinder timely progression through sequential treatment steps. The pronounced drop-off after surgery suggests system-level barriers in transitioning patients to adjuvant therapy. Addressing these gaps will require proactive coordination, navigator involvement, and targeted interventions for high-risk groups.

TREATMENT CASCADE

SURGERY → CHEMOTHERAPY → RADIATION → HORMONE/ IMMUNOTHERAPY

Proportion of Patients With Cumulative Delays



Disclosures: None
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