Impact of Protein Energy Malnutrition on Clinical Outcomes in Hospitalized Breast Cancer Patients: An Analysis of the 2021 National Inpatient Sample

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Background

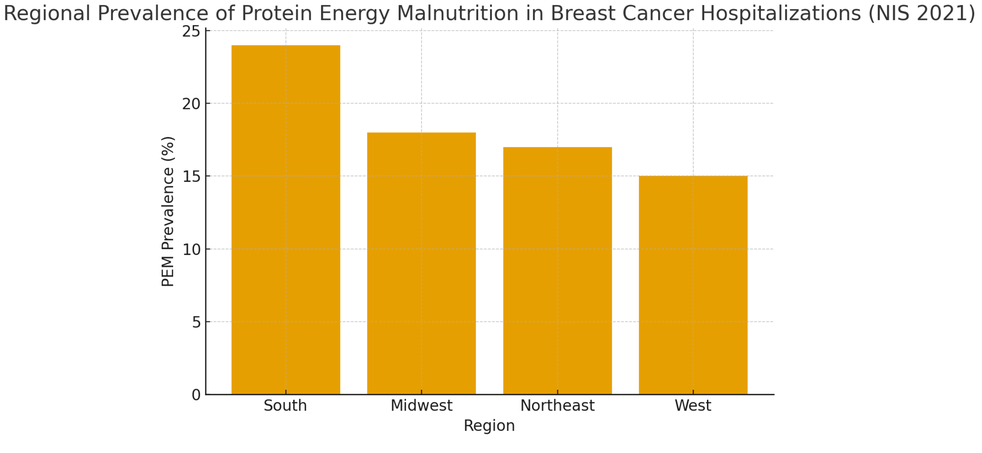
- Protein Energy Malnutrition (PEM) is common among hospitalized patients with breast cancer and is associated with adverse clinical outcomes.
- The specific impact of PEM on inpatient mortality, length of stay, and hospitalization costs in breast cancer patients has not been well characterized.
- This study aims to quantify the burden of PEM and evaluate its independent association with inpatient outcomes among breast cancer hospitalizations.

Methods

- We utilized the 2021 National Inpatient Sample (NIS) to identify hospitalizations with a documented diagnosis of breast cancer. Cases of Protein Energy Malnutrition (PEM) were identified using validated ICD-10-CM codes.
- Survey-weighted logistic and linear regression models were employed to assess the association between PEM and clinical outcomes, including inpatient mortality, length of stay, and total hospitalization charges.
- All models were adjusted for age, sex, race, Charlson Comorbidity Index, ZIP code income quartile, hospital location (urban or rural), teaching status, region, and hospital bed size.
- The Charlson Comorbidity Index (CCI) was categorized as 0 for no comorbidities, 1 for one comorbidity, 2 for two comorbidities, and ≥3 for three or more comorbidities.

Results

- The final study cohort consisted of 491,634 breast cancer hospitalizations, of which 98,327 (20%) had a diagnosis of PEM.
- The prevalence of PEM among breast cancer hospitalizations was highest in the South (24%), followed by the Midwest (18%), Northeast (17%), and West (15%).
- The mean age of the cohort was 65.2 years, and 63.4% of patients were female.
- The racial distribution included 67.1% White, 16.9% Black, 9.8% Hispanic, and 6.2% from other racial groups.
- More than 60% of patients had a Charlson Comorbidity Index score of three or greater, and the majority of hospitalizations occurred in teaching hospitals (75.4%) and urban facilities (92.2%).



- In adjusted analyses, PEM was independently associated with more than twice the odds of in-hospital mortality (adjusted odds ratio 2.41; 95% CI: 2.25–2.59; p<0.001), an average increase of 5.3 days in length of stay (β = 5.33; 95% CI: 5.09–5.58; p<0.001), and $65,294 higher total hospitalization costs (β = $65,294; 95% CI: $57,863–$72,726; p<0.001).

Total hospitalizations	491,634
With Protein Energy Malnutrition	98,327 (20%)
Mean age (years)	65.2
Female (%)	63.4
White (%)	67.1
Black (%)	16.9
Hispanic (%)	9.8
Other races (%)	6.2
Teaching hospitals (%)	75.4
Urban facilities (%)	92.2

Discussion

- Protein Energy Malnutrition is highly prevalent among hospitalized breast cancer patients and is independently associated with significantly worse inpatient outcomes.
- The disproportionately high burden of PEM in the Southern United States suggests regional disparities in nutritional screening, access to care, and social determinants of health.
- These findings underscore the importance of early nutritional screening and intervention to improve clinical and economic outcomes in this vulnerable population.

Conclusion

- In this national cohort, Protein-energy malnutrition (PEM) is seen to affect approximately one in five cancer patients. Similar or even higher prevalence rates have been reported in other studies.(1)
- The presence of PEM was strongly associated with increased in-hospital mortality, prolonged hospital stay, and substantially higher hospitalization costs.
- Early nutritional screening and intervention are essential strategies to improve outcomes and reduce healthcare costs in hospitalized breast cancer patients.

Reference

1. Hébuterne X, Lemarié E, Michallet M, de Montreuil CB, Schneider SM, Goldwasser F. Prevalence of malnutrition and current use of nutrition support in patients with cancer. JPEN J Parenter Enteral Nutr. 2014 Feb;38(2):196-204. doi: 10.1177/0148607113502674. PMID: 24748626.

Disclosure

Christie Hilton serves in a consultant/advisory role for Astra Zeneca, Bio-theranostics and Gilead. In the past she was on the speakers bureau for Astra Zeneca and Diiachi Sanyo. She works as a protocol officer at the NSABP and is on the board for the Glimmer of Hope Foundation Pittsburgh.