

The role of referral patterns and geographical distance on stage at presentation in South Africa - a review of South African breast units

Catharina Pothas¹, Sarah Nietz^{1,2}, Maureen Joffe^{2,3}, Oluwatosin Ayeni^{2,3}, Witness Mapanga²

Department of Surgery, Faculty of Health Sciences, University of the Witwatersrand¹
Non-communicable Diseases Research Division, Wits Health Consortium (PTY) Ltd, University of the Witwatersrand² SAMRC/Wits Developmental Pathways for Health Research Unit, Department of Pediatrics, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, Gauteng, South Africa³

Introduction: According to GLOBOCAN 2018 breast cancer incidence is now on par with lung cancer incidence worldwide. Breast cancer incidence has been low in Africa in the past, but now breast cancer accounts for most cancer deaths in women in many sub-Saharan African nations. The aim of this study is to examine the role of referral patterns and geographical distance to stage at presentation.

Methods: We used data from a cohort of women enrolled in the ongoing South African Breast Cancer and HIV Outcomes study (SABCHO) collected from April 2015 to December 2018. The recruitment sites were Charlotte Maxeke Johannesburg Academic Hospital (CMJAH) and Chris Hani Baragwanath Academic Hospital (CHBAH) in Gauteng province, Grey's Hospital, Pietermaritzburg and Durban Complex Hospitals (Addington and Inkosi Albert Luthuli Hospitals) in KwaZulu-Natal province. All adult females newly diagnosed with primary invasive breast cancer were included. The participants were grouped into both early (I and II) and advanced (III and IV) stage breast cancer. Demographic data (age, residential distance, referral pattern), histological characteristics (intrinsic subtypes and grade) and social factors (level of education, employment status, HSES) were compared. We identified determinants of advanced stage breast cancer using bivariate and multivariate logistic regression models. Ethics approval number M150351.

Results: Of the 2930 participants enrolled in the cohort, 1682 (57.0%) presented with advanced stage disease. On multivariate analysis, adjusting for age, level of education, knowledge of breast cancer and receptor subtype, the factors associated with advanced stage were time of presentation to the health system and mode of referral. Those who reported having taken 1-3 months (OR = 1.32, 95%CI: 1.04–1.69) and >3 months (OR = 1.98, 95%CI: 1.62–2.43) after noting a breast symptom to visit a healthcare facility were more likely to present with late stage disease at diagnosis than patients who had taken less than one month. Indirect referral patterns such as referral from secondary hospitals were more likely to present with advanced stage breast cancer (OR=1.40, 95% CI 1.15-1.71) than direct referrals (self-referral, primary care clinic or general practitioner). Geographical distance was statistically significant on bivariate analysis but had no influence on stage at presentation on multivariate analysis ($p < 0.001$, OR = 1.04, 95%CI 0.85-1.27).

Conclusion: Referral patterns play an important role as a barrier to care in the South African public sector. Direct referral routes are needed with simple access to specialised breast units. Further investigation to minimise causes for advanced presentation is required.