

Title: Multimorbidity and Breast Cancer in sub-Saharan Africa: Profile and Impact on Stage at Diagnosis and Breast Cancer Treatment Decisions.

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ABSTRACT

Background

Multimorbidity (the co-occurrence of two or more chronic conditions in one person) poses a challenge to patient care in South Africa and sub-Saharan African (SSA) countries in transition. Breast cancer remains the most common cancer among women worldwide and is a major contributor to women's cancer deaths. The mortality-to-incidence ratios are among the highest globally, mainly due to advanced stage at diagnosis and suboptimal management.

Presence of existing chronic conditions at the time of breast cancer diagnosis may further challenge breast cancer control in SSA. Multimorbidity in women with breast cancer can be burdensome, may negatively influence time to and stage at presentation, negatively impact treatment decisions and outcomes. Multimorbidity in breast cancer patients may present challenging considerations for targeted patient-oriented prevention, diagnosis, treatment, disease control and improved outcome control strategies. The burden of multimorbidity in women with breast cancer, its determinants and impact on stage at diagnosis and cancer treatment decisions in South Africa and SSA is yet to be understood.

Aim

The overall aim of this thesis was to determine the prevalence and patterns of chronic conditions and multimorbidity in women with breast cancer and its associations with stage at diagnosis and cancer treatment decisions in SSA.

The following specific study objectives addressed this aim: 1) To characterize and compare socioeconomic factors and chronic conditions among women with breast cancer from Soweto, South Africa and their age and neighbourhood matched controls; 2) To assess the multimorbidity burden of women newly diagnosed with breast cancer in 5 public hospitals in South Africa and the associations of these chronic conditions and multimorbidity with breast cancer stage at diagnosis and first breast cancer treatment received; 3) To determine profiles and patterns of chronic conditions and multimorbidity in women newly diagnosed with breast cancer in 5 countries in SSA and their associations with stage at diagnosis.

Methods

This thesis utilizes three cohorts with increasing context and environmental complexity for women with breast cancer, to address its objectives and test the same hypotheses in order to identify unique and universal findings. The first is a single country local region cohort,

The second comprises a regional five site cohort from different regions of the same country and the third covers five countries in SSA with varying income status.

Cohort 1 (Objective 1) is a population based case-control study on breast cancer among black women, in Soweto, South Africa. Cohort 2 (Objective 2) is a cohort of women newly diagnosed with breast cancer at 5 academic public hospitals in Gauteng and KwaZulu Natal provinces of South Africa. Cohort 3 (Objective 3) is a multi-country cohort of women newly diagnosed with breast cancer in SSA.

Data on sociodemographic factors, self-reported chronic conditions, blood pressure and anthropometric measurements, HIV-status and point-of-care lipid and glucose levels were collected. Sociodemographic associations with individual chronic conditions and multimorbidity (≥ 2 of chronic conditions) were explored. Associations between individual chronic conditions and multimorbidity with stage at diagnosis of breast cancer (advanced (III-

IV) vs. early (I-II)) were analysed using multivariable logistic regression models. Finally, association of multimorbidity with first breast cancer treatment received was determined.

Result

The prevalence of multimorbidity in these three cohorts of women with breast cancer ranged from 27-44%. For individual chronic conditions the prevalence was higher for hypertension (range: 32-59%), obesity (35-57%), and HIV (16-22%) than for diabetes (7-14%), tuberculosis (4-7%) and asthma/ chronic obstructive pulmonary disease (COPD) (4-5%). There is a steady increasing trend for hypertension and obesity with increasing wealth status of country. Older women and those with higher socioeconomic status were more likely to have obesity, hypertension, diabetes and multimorbidity and were less likely to be HIV positive, this finding is consistent across settings. In the multivariable regression model, multimorbidity was not associated with advanced stage breast cancer at diagnosis across settings but for self-reported hypertension there was less likelihood of being diagnosed with advanced stage disease in the adjusted models across settings. Obesity was also associated with early stage breast cancer at diagnosis only in the multi-country cohort. Women with multimorbidity were less likely to have surgery, less likely to receive chemotherapy and more likely to receive endocrine therapy compared to women without multimorbidity in those with early stage breast cancer, $p=0.003$.

Conclusion

The prevalence of multimorbidity is high among patients with breast cancer across different settings in SSA, mainly driven by socio-demographic factors, notably higher socio-economic status across different settings. These universal findings are particularly worrying and require urgent intervention. There is need to further understand the down-staging impact of hypertension and obesity on stage at diagnosis and the impact of multimorbidity on breast

cancer outcomes. Multimorbidity had a significant negative impact on first treatment received in those with early stage disease, which may negatively impact survival outcomes.