Clinical Characteristics and Outcomes of Breast Cancer in Botswana: A Prospective Cohort Study

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Purpose

- Breast cancer is a leading cause of cancer death in women worldwide
- There is generally a higher incidence of breast cancer in high-resource settings like North America compared to lower-resource settings like sub-Saharan Africa (SSA)
- However, the mortality-to-incidence ratio is significantly higher in SSA than North America
- Currently there is limited primary literature describing the burden of breast cancer in many regions of SSA including Botswana
- We aim to characterize the clinical attributes and outcomes of women with breast cancer in Botswana

Methods

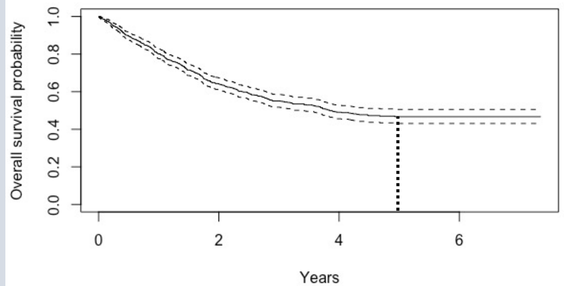
- Women with breast cancer in this study were sampled from the Thabatse Cancer Cohort study
- The prospective Thabatse Cancer Cohort study in Botswana began enrolling participants in 2010 and has enrolled over 5,000 participants to date
- Participants with biopsy-confirmed cancer aged 18 years or older are recruited from the four main oncology referral hospitals in Botswana
- Baseline clinical data is obtained, and participants are followed quarterly for up to 5 years
- Certification of death are obtained from families, providers, and death certificates
- 902 participants in the Thabatse study with biopsy-confirmed breast cancer enrolled between January 2010 and January 2021 were included in this analysis

Results

Table 1: Breast cancer landscape in Botswana

Study Variable3	Descriptive Statistic
N of study (N of cohort)	902 (5388)
Age at enrollment	
Median (IQR)	51.6 (43.0 - 62.9)
HIV status at enrollment	
Positive	273 (30.3%)
Negative	606 (67.2%)
Unknown	23 (2.5%)
Immunohistochemistry	686 (76.1%)
ER/PR+	442 (64.4%)
ER/PR-, HER2+	74 (10.8%)
ER/PR/HER2-	170 (24.8%)
Stage at diagnosis	798 (88.5%)
I	28 (3.5%)
II	255 (32.0%)
III	416 (52.1%)
IV	99 (12.4%)
Surgery ✓	597 (66.2%)
Mastectomy	535 (89.6%)
Lumpectomy	62 (10.4%)
Chemotherapy ✓	501 (55.5%)
Radiotherapy ✓	356 (39.5%)
Chemoradiation ✓	266 (29.5%)

Figure 2: Breast cancer survival in Botswana



5-year-survival (from enrollment date):

- 46.9% (95% CI 43.3-50.8%)

Table 2: Survival by HIV and receptor status

Study Variable	Hazard Ratio (95% CI)	
	Unadjusted	Adjusted⁺
HIV positive	1.36 (1.11-1.67)*	1.16 (0.92-1.46)
Receptor status		
ER/PR+	--	--
ER/PR-/HER2+	1.32 (0.93-1.89)	1.53 (1.04-2.24)*
ER/PR/HER2-	1.44 (1.11-1.85)*	1.60 (1.22-2.10)*

⁺adjusted for: age at consent, HIV status, stage, receptor status, operation status, chemo status, and radiation status
*p-value <0.05

Limitations

- Incomplete immunohistochemistry data at diagnosis
- Limited information in surgical operation notes ("mastectomy" most commonly means modified radical mastectomy with full axillary lymph node dissection)
- Incomplete information on reasons for not starting or discontinuing chemotherapy and/or radiotherapy

Conclusions

- Demonstrates clinical characteristics of breast cancer in Botswana by utilizing an ongoing prospective cancer cohort study
- Most participants presented at late stage and received mastectomy rather than breast-conserving therapy
- Receptor status comparable to that of North America (slightly lower hormone-positive cases may be explained by younger cohort)
- Chemotherapy and radiotherapy were received by 57.0% and 34.5% of women, respectively, with breast cancer in this study
- Botswana's governmental partnership with a local private hospital likely increased the rate of radiotherapy received
- In adjusted analyses, HER2 positivity and Triple-Negative status were associated with worse outcomes compared to hormone-positive subtypes

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