

**DECLARATION**

I, Natalia Mbewe, declare that this dissertation represents my own work and that all the sources I have quoted have been indicated and acknowledged by means of complete reference and that it has not previously been submitted for a Degree, Diploma or other qualifications at this or another University. It has been prepared in accordance with the guidelines for Master of Science Degree in Pathology (Clinical Pathology) dissertations for the University of Zambia.

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**SUPERVISOR:**

I have read this dissertation and approved it for submission.

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**CERTIFICATE OF APPROVAL**

The University of Zambia approves this dissertation of Natalia Mbewe, in partial fulfilment for the requirements for the award of the degree of Master of Science in Pathology (Clinical Pathology).

Examiner's signature

Date

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**Examiner I**

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**Examiner II**

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**Examiner III**

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**Head of Department**

Signature.....

Date.....

**CERTIFICATE OF COMPLETION OF DISSERTATION**

I, Natalia Mbewe do hereby certify that this dissertation is the product of my own work and in submitting it for my Master of Science in Clinical Pathology programme, further attest that it has not been submitted to another University in part or whole for the award of any programme.

Signature..... Date.....

I, Dr Trevor Kaile, having supervised and read this dissertation, I am satisfied that this is the original work of the author under whose name it is being presented. I confirm that the work has been completed satisfactorily and is ready for final submission.

Supervisor: Dr Trevor Kaile

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# IMMUNOHISTOCHEMICAL CHARACTERIZATION OF BREAST CANCER AT THE UNIVERSITY TEACHING HOSPITAL IN LUSAKA

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## ABSTRACT

### Introduction

Breast cancer remains among the most commonly diagnosed cancers in women. Worldwide, breast cancer comprises 22.9% of all cancers. In Zambia, it is ranked number 2 at 11% after cervical cancer (60%). However, the current prevalence can be reduced through sensitization programmes encouraging women to go for screening for example using mammogram. In this study, the aim was to characterize the histological phenotypes of breast cancer at the University Teaching Hospital in Lusaka, Zambia.

### Methods

This was a laboratory based cross-sectional study done at the University Teaching Hospital (UTH) in Histopathology laboratory in Lusaka, Zambia for six months. A convenient sampling method was used to select the 44 formalin fixed-paraffin embedded tissue blocks of breast tissue diagnosed with breast cancer on histology for the year 2012. The specimens were from patients aged between 21 and 70 years old. Tissue sectioning, H & E staining, cover slipping and microscopic examinations was done under the supervision of a qualified histopathologist in order to determine the histological types of breast cancer which were later analyzed for the following immunohistochemical profiles-P53, HER2, VEGF and CK5/6.

### Results

Findings were analyzed using statistical software SPSS for Windows, Version 20. Age, histology and IHC results were variables under consideration. Chi-square and Fisher's Exact test with a P-Value of less than 0.05 were used to indicate statistical significance of findings.

Results revealed that breast cancer was more prevalent 54.5% in the samples from patients that were aged 30-49 years than in those that were 50 years and above 45.5%. On histological evaluation, it was found that most samples 25 (57%) had lobular carcinoma (LC) while 19 (43%) had ductal carcinoma (DC). Further analysis showed that out of the 24 samples that came out positive for breast cancer for those 30-49 years, 13 (52.2%) had LC while 11 (45.8%) had DC. Similarly, samples from those that were aged 50 and above showed a similar pattern with LC accounting for the majority: 12 (60%) out of the total of 20 samples with only 8 (40%) DC. On IHC analysis, P53 and VEGF were overexpressed in LC than DC while CK5/6 was over expressed in DC than LC. HER2 was equally expressed in LC and DC.

### Discussion

The study has shown that breast cancer is more frequent between the ages of 30-49 years and that breast cancer in Zambia is predominantly of LC and DC histological types although lobular carcinoma is found to be with higher frequency than DC. Further IHC analysis revealed that P53 and VEGF were overexpressed in LC than DC while CK5/6 was over expressed in DC. However, HER<sub>2</sub> was equally expressed in both LC and DC.

**Keywords:** Breast cancer, Lobular carcinoma, Ductal carcinoma, Histology, Phenotypes

## **DEDICATION**

To my late father, Mr Gilbert Mbewe for his unwavering encouragement he accorded me whilst doing part one of this work before he died. May His Soul Rest in Peace.

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## ACRONYMS/ABBREVIATIONS

BCPT	Breast cancer profiling test
BRCA1	Breast cancer gene 1
BRCA 2	Breast cancer gene 2
CDH	Cancer Diseases Hospital
DC	Ductal Carcinoma
DCIS	Ductal Carcinoma In-Situ
ER	Estrogen Receptor
HE	Haematoxylin and Eosin
HER <sub>2</sub>	Human Epidermal Growth Factor Receptor 2
IHC	Immunohistochemistry
LC	Lobular Carcinoma
LCIS	Lobular Carcinoma In Situ
LCIS	Lobular Carcinoma in situ
PR	Progesterone Receptor
US	United States
UTH	University Teaching Hospital
VEGF	Vascular Endothelial Growth Factor