Evaluation of a New Technique for Early Detection of Breast Lesions among Females Attending National Cancer Institute, Cairo University

Thesis

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بسم الله الرحمن الرحيم

﴿قَالُواْ سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ﴾

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ABSTRACT

Breast cancer is the most important cancer affecting women. It is by far the commonest cancer among Egyptian women and represents 37% of all female cancers.

Aim: assess different risk factors of breast cancer, assess the knowledge about risk factors and early detection methods of breast cancer and identify the validity (sensitivity; specificity; predictive values; accuracy) and agreement of breast light in screening of breast cancer compared to mammography and biopsy if available.

Subjects and Methods: Hospital-based cross sectional study was conducted at National Cancer Institute, Cairo University in the period from 20 April 2012 till 20 February 2014. The study tools included: ١- interviewer administrated questionnaire. It was prepared to get some socio-demographic characteristics, and risk factors of breast cancer, assess knowledge about risk factors of breast cancer and early detection measures of breast cancer. ٢- Evaluation of breast using breast light technique. ٣- Mammographic and ultrasound evaluation of the breast. ٤- Pathological results of specified cases if biopsy or surgical excision was performed were retrieved from patient's records.

Results: The study involved 310 females. The frequency of breast cancer more common among: old age, illiterate cases, women who had early menarche and later menopause, females use of hormonal contraception, women had first birth at age $\geq$ 30 years, women's sleep <7 hours/day, women with total physical activity <9 MET-h/week. Only 27.1 % of the participants knew about early detection measures of breast cancer. Breast self-examination was known by 11% of the participants as a method of early detection. Breast illumination method had sensitivity of 93.0%, specificity of 73.7%, Positive predictive value (PPV) of 91. 4%, negative predictive value (NPV) of 77.8% and total accuracy of breast illumination method was 88.2% in detection of breast cancer. Breast illumination and mammogram were concordant in 89.4%.

The study **concluded** that. Breast-light was highly effective in identifying breast cancer and it is considered to be an important tool in the early detection of breast cancer. The study **recommended** the need for health education to improve awareness about breast cancer and early detection measures of breast cancer. Use of breast illumination method in primary health care centre and by women at home in particular it would be of great assistance for early detection of breast cancer.

Key words: Breast cancer, Early detection, Mammogram, Breast illumination Methods

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LIST of ABBREVIATIONS

ACS	American Cancer Society
ACR	American College of Radiology
ADH	Atypical Ductal Hyperplasia
AICR	American Institute for Cancer Research
AJCC	American Joint Committee of Cancer
ATM	Ataxia Telangiectasia Gene
B	Regression Coefficient
BIRAD	Breast Imaging Reporting and Data System
BMI	Body Mass Index
BSE	Breast Self-Examination
CBE	Clinical Breast Examination
CI	Confidence Interval
CYP1A1	Cytochrome P450, family 1, subfamily *A*
DCIS	Ductal Carcinoma In- situ
DDE	Dichloro Diphenyl Dichlroethylene
DDT	Dichloro- Diphenyl- Trichloroethane
DMIST	Digital Mammographic Screening Trial
DMPA	Depo-Medroxyprogestron -Acetate
DNA	Deoxyribonucleic Acid
E	Estrogen
EMF	Electromagnetic Field
EP	Estrogen-Progesterone
ER	Estrogen Receptor
ERPR	Estrogen Receptor-Progesterone Receptor
GI	Glycemic Index
GL	Glycemic Load
H	Hour
HAAs	Heterocyclic Aromtic Amin
HR	Hazard Ratio
HRT	Hormone Replacement Therapy
IGF-1	Insulin Growth Factor-1
IRR	Incidence Rate Ratio
IARC	International Agency for Research on Cancer
IRB	Institutional Review Board
LCIS	Lobular Carcinoma In- situ
LN	Lobular Neoplasia
LR+	likelihood Ratio for Positive Test
LR-	likelihood Ratio for Negative Test
M	Month
MRI	Magnetic Resonance Imaging
MET	Metabolic Equivalent
MET h/week	Metabolic Equivalent/hours/week
M	Month
NAT2	N- Acetyl Transferase2
NCI	National Cancer Institute

NCRPE	National Cancer Registry Program of Egypt
NPV	Negative Predictive Value
OCs	Oral Contraceptives
OCP	Oral Contraceptive Pills
OR	Odd Ratio
ORs	Odd Ratios
PA	Physical Activity
PCBs	Polychlorinated Biphenyls
PR	Progesterone Receptor
PPV	Positive Predictive Value
PTEN	Phosphatase and Tensin Homolog
Q	Quintile
RR	Relative Risk
SHBG	Six Hormone Binding Globulin
SD	Standard Deviation
SE	Standard Error
TDDU	Telediaphanography with Doppler Ultrasound
TDLUs	Terminal Ductal Lobular Units
TP-53	Tumor Protein- 53
USPSTF	United States Preventive Services Task force
VS	Versus
WCRF	World Cancer Research Fund
WHI	Women Health Initiative
WHO	World Health Organization
yrs	Years

LIST of IMPORTANT DEFINITIONS

Term	Definitions
Breast Light	Hand held device emit high intensity light, trans illuminate breast to detect any breast lesions
Mammogram	Mammography is an x- ray machine which detects breast cancer
Metabolic Equivalent (MET)	One MET represents the rate of oxygen consumption (VO2) of a seated individual at rest, equivalent to approximately 3.5 ml·kg-1·min-1. Thus, an individual performing an activity of 4 METs is consuming oxygen at a rate 4 times that at rest
Positive Predictive Value	Probability that the disease is present when the test is positive.
Negative Predictive Value	Probability that the disease is not present when the test is negative.
Risk Period for Breast cell	The time from menarche till first full pregnancy and it corresponded to the time for complete maturation of breast tissue cells
Screening of Breast Cancer	Detect early disease when it asymptomatic
Sensitivity	Probability that a test result will be positive when the disease is present.
Specificity	Probability that a test result will be negative when the disease is not present.

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INTRODUCTION

Breast cancer is a disease affecting both developed and developing countries ***(Dündar et al., 2006).*** It ranks as the fifth cause of death from cancer overall and is still the leading cause of cancer mortality in women (***WHO, 2012)***.

Breast cancer is the most common cause of cancer mortality, accounting for 16% of cancer deaths in women. It is estimated that 7.4 million people died of cancer in 2004 and, if current trends continue, 83.2 million people will have died by 2015 ***(World Health Organization, 2008).***

Women have one in eight risk of having breast cancer during their lifetime and early detection through screening is the only way to reduce morbidity and mortality ***(Beydağ and Yürügen, 2010).***While breast cancer incidence has been shown to have stabilized or to be decreasing in some western countries, breast cancer burden has steadily increased in many developing countries (***Parkin et al., 2008***).

In Egypt, breast cancer is the most common cancer among women, representing 18.9% of total cancer cases (35.1% in women and 2.2% in men) ***(Elatar et al., 2013)***, according to **Gharbiah Population Based Cancer Registry**, breast cancer was the most frequent cancer among females as it represented 17.5% of all incident cancers, accounting for 35.7% of all newly diagnosed female cancers ***(Ibrahim et al., 2007).***

The survival rate from breast cancer in developing countries is generally poorer than in developed countries, primarily as a result of delayed diagnosis of cases. Breast cancer is a dangerous disease but it could be very simple to treat if discovered in an early stage ***(Motawy et***