Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.JournalofSurgicalResearch.com

Association for Academic Surgery

Clinical breast examination screening by trained laywomen in Malawi integrated with other health services

Lily Gutnik, MD, MPH,[a,*,1] *Clara Lee, MD, MPP,*[a,b] *Vanessa Msosa, MBBS,*[c] *Agnes Moses, MBBS, MMed,*[a,b,d,f] *Christopher Stanley, MS,*[a] *Suzgo Mzumara, MBBS, MMed,*[e,f] *N. George Liomba, MBBS, FRC(Path),*[a] *and Satish Gopal, MD, MPH*[a,b,f]

[a] *UNC Project-Malawi, Lilongwe, Malawi*
[b] *University of North Carolina, Lineberger Comprehensive Cancer Center, Chapel Hill, North Carolina*
[c] *Department of Surgery, Kamuzu Central Hospital, Lilongwe, Malawi*
[d] *Department of Medicine, Kamuzu Central Hospital, Lilongwe, Malawi*
[e] *Department or Radiology, Kamuzu Central Hospital, Lilongwe, Malawi*
[f] *University of Malawi College of Medicine, Blantyre, Malawi*

ARTICLE INFO

Article history:
Received 4 December 2015
Received in revised form
20 March 2016
Accepted 14 April 2016
Available online 22 April 2016

Keywords:
Breast cancer
Screening
Global health
Laywomen

ABSTRACT

Background: Breast cancer awareness and early detection are limited in sub-Saharan Africa. Resource limitations make screening mammography or clinical breast examination (CBE) by physicians or nurses impractical in many settings. We aimed to assess feasibility and performance of CBE by laywomen in urban health clinics in Malawi.

Methods: Four laywomen were trained to deliver breast cancer educational talks and conduct CBE. After training, screening was implemented in diverse urban health clinics. Eligible women were ≥30 y, with no prior breast cancer or breast surgery, and clinic attendance for reasons other than a breast concern. Women with abnormal CBE were referred to a study surgeon. All palpable masses confirmed by surgeon examination were pathologically sampled. Patients with abnormal screening CBE but normal surgeon examination underwent breast ultrasound confirmation. In addition, 50 randomly selected women with normal screening CBE underwent breast ultrasound, and 45 different women with normal CBE were randomly assigned to surgeon examination.

Results: Among 1220 eligible women, 1000 (82%) agreed to CBE. Lack of time (69%) was the commonest reason for refusal. Educational talk attendance was associated with higher CBE participation (83% *versus* 77%, $P = 0.012$). Among 1000 women screened, 7% had abnormal CBE. Of 45 women with normal CBE randomized to physician examination, 43 had normal examinations and two had axillary lymphadenopathy not detected by CBE. Sixty of 67 women (90%) with abnormal CBE attended the referral visit. Of these, 29 (48%) had concordant abnormal physician examination. Thirty-one women (52%) had discordant

* *Corresponding author*. Lily Gutnik, MD, MPH, UNC Project-Malawi, Private Bag A-104, Lilongwe, Malawi. Tel.: +265 1 755 056; fax: +265 1 755 954.
E-mail address: lily.gutnik@mail.harvard.edu (L. Gutnik).
[1] Present address: Montefiore Medical Center/Albert Einstein College of Medicine, 111 East 210 Street, Bronx, NY 10467.
0022-4804/$ – see front matter
http://dx.doi.org/10.1016/j.jss.2016.04.017

normal physician examination, all of whom also had normal breast ultrasounds. Compared with physician examination, sensitivity for CBE by laywomen was 94% (confidence interval [CI] 79%-99%), specificity 58% (CI, 46%-70%), positive predictive value 48% (CI, 35%-62%), and negative predictive value 96% (CI, 85%-100%). Of 13 women who underwent recommended pathologic sampling of a breast lesion, two had cytologic dysplasia and all others benign results.

Conclusions: CBE uptake in Lilongwe clinics was high. CBE by laywomen compared favorably with physician examination and follow-up was good. Our intervention can serve as a model for wider implementation. Performance in rural areas, effects on cancer stage and mortality, and cost effectiveness require evaluation.

Introduction

Breast cancer burden and mortality are high in low-and-middle-income countries (LMIC). The majority of newly diagnosed breast cancers in the United States are stage I or II, whereas most new breast cancers in LMIC are stages III or IV.[1] Higher mortality in LMIC *versus* resource-rich settings is partly because of lack of breast cancer awareness and early detection. According to the 2003 World Health Survey, only 2% of women aged 40-69 y in LMIC had received any breast cancer screening.[2]

Screening mammography is recommended in many high-income countries, but LMIC often lack infrastructure to implement this.[3,4] International guidelines recommend alternative methods like clinical breast examination (CBE) in settings where mammography is not feasible.[5-7] Even in high-resource settings, annual CBE may be as effective as mammography in reducing breast cancer mortality.[8-11] CBE can also be effective and cost effective in LMIC settings.[12-15]

Given health workforce constraints in LMIC, task shifting has emerged as an important strategy for service delivery, which may be valuable for CBE implementation. Task shifting involves training lower cadres of health workers to perform tasks traditionally reserved for more highly trained individuals. In several countries, CBE has been effectively task shifted to community health workers and lay volunteers, with increased detection of early-stage cancers and high levels of agreement with physician examination.[16-20] Task shifting has also been important in achieving scale-up of antiretroviral therapy (ART) for HIV-infected individuals in sub-Saharan Africa (SSA).[21] Comprehensive care for HIV in SSA has increasingly integrated other health services together with ART provision, and such bundling approaches may be similarly effective for cancer screening. In SSA to date, use of laywomen to conduct CBE has only been studied in Sudan, and this approach has not been studied in combination with other health services.

In Malawi, breast cancer is the third most common cancer among women.[22] Patients are typically diagnosed at late stages with long symptom durations before diagnosis.[23] The Malawi Ministry of Health has prioritized early detection of breast and cervical cancer in the national strategic plan.[24] However, no coordinated breast cancer screening program currently exists. We describe a pilot study training laywomen to perform CBE screening and promote breast cancer awareness among women attending various health clinics in the capital, Lilongwe. Our primary objectives were to assess feasibility and acceptability of this approach in urban settings, evaluate effectiveness of trained laywomen to conduct CBE, and describe CBE findings and follow-up among women screened. To our knowledge, this is the first breast cancer screening study in Malawi, and the first study from SSA to assess layperson-conducted CBE integrated with other health services.

Methods

We identified and recruited four laywomen as breast health workers (BHWs) by engaging local staff at the research site and breast cancer advocates. BHWs underwent a 4-wk training program, consisting of lectures, online modules, role-playing, case discussions, CBE using simulators and patients, and oral presentation practice.[25] Ministry of Health trainers taught health communication, promotion, and education skills. Breast cancer survivors shared their experiences. Surgeons taught breast cancer epidemiology, prevention, detection, and clinical care. Surgeons and research staff taught research ethics, informed consent, data collection, and professionalism.[26]

The CBE practice component used a simulator with 27 different tumors and lymph nodes of varying shapes and sizes in a torso with breasts, axillae, and supraclavicular regions. It also included benign masses and models with *peau d'orange*. We taught BHWs to visually inspect breasts for asymmetry, lumps, skin changes, edema, nipple retraction, discharge, or axillary swellings. To palpate the breast, we taught BHWs to use the pads of the middle three fingers with overlapping dime-sized circular movements. Palpation of axillary, infraclavicular, and supraclavicular lymph nodes was also taught. They also practiced CBE under supervision with each other and on consenting patients from outpatient clinics.[25]

BHWs learned to deliver a standardized breast cancer educational talk using a flip chart. To assess BHW competency in delivering educational talks before implementation of the program, three independent Malawian evaluators unaffiliated with the study evaluated each BHW during 12 talks, using a 5-point scale for 22 discrete topics grouped into four main areas: introduction, delivery, knowledge, and interactiveness.

Malawi and the US IRBs were obtained before study commencement. Screening was implemented in five clinics. Three clinics for outpatient general medicine, sexually transmitted infections, and colposcopy were on the campus of Kamuzu Central Hospital (KCH), one of two national teaching hospitals in Malawi. KCH is a 1000-bed public tertiary care