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BREAST CANCER IN PAPUA NEW GUINEA AND OTHER PACIFIC ISLAND COUNTRIES: A REVIEW

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ABSTRACT:
Breast cancer is among the top five cause of mortality among young women in Papua New Guinea and the Pacific Island countries. Most of these women usually present to their hospitals with advanced breast cancer stages and almost all outcomes are poor. This is largely due to progressive change in their cultural and socio economic status and beliefs about health and diseases like cancer. Western lifestyle and diets have shown positive association in developing breast cancers among women from these countries. At present these countries have limited available resources or almost none for cancer care and management, therefore early public health interventions and education about cancer is the way forward for all the countries in the region. Despite the increasing international assistance in funding and programs, host nations in the pacific are yet to show ownership about their disease burden and public health policies.

Keywords: Breast cancer, Risk, Pacific, Papua New Guinea
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INTRODUCTION:

Cancer is a dreaded pandemic disease. According to WHO and Global cancer statistics, the number of new cases and cancer mortality has been increasing over the last decade [1, 2]. This projection is highly unlikely to decrease in the near future as public health practices and the epidemiological dynamics, shifts within and between developed countries and developing countries.

Global information revealed that breast cancer is the number one cause of cancer deaths among women [1, 2]. On the regional perspective, breast cancer is the second highest cause of death after cervical cancer in Pacific Island women [2]. This trend is unlikely to change in the near future while breast cancer mortality in women in Australia and New Zealand have reached a plateau and is showing signs of falling [1-3].

Breast Cancer like cervical cancer in Pacific Island women has a moderate difference in occurrence and the overall dynamics on diagnosis and treatment compared to other regions and countries. This review article discusses breast cancer among Pacific Islanders and its many compounding variables, current available cancer services and the local government programs on cancers. The international quota on cancer services for these countries will also be further discussed. This review provides understanding about the current breast cancer status among Papua New Guinean and other Pacific Island women and provides insight for future interventions.

Definition:

Breast cancer is the cancer that arises generally from the breast tissue or mammary gland. The breast is made up of the multipleacini and lobules, which produce milk, and the ducts that connect the lobules to the nipple, collectively called the functional unit of the breast [3]. Cancer can also arise from the other neighboring tissue or supporting tissues on the chest wall like the muscle, fatty tissue, lymphatics, blood vessel tissue and the chest wall bones or ribs and cartilages. In clinical practice and in this review, breast cancer will be highly referred to the breast tissue proper and its axillary tail or extension into the axillae only.

Recent Background on Breast cancer:

Until now as reported by GLOBOCAN 2018[2] on breast cancer, there are 2 million new cases of breast cancer globally since 2017 with just over 600,000 deaths. In the Western Pacific regionin which this paper focuses on, age standardized incidence rates in females per 100,000 showed the following; Australia 94.5, New Zealand 92.6, Fiji 63.4, Vanuatu 29.5, New Caledonia 98.0 and Solomon Islands 45.6. While mortality rates per 100,000 has shown that Australia scores 12.3, New Zealand 14.2, Fiji 36.9, Vanuatu 12.5, New Caledonia 18.3 while in the Solomon Islands it is 14.9 [4].Despite Australia and NZ being within the region of interest, they are developed countries. Their incidence rate of breast cancer morbidity is high, yet their mortality rate has reached a plateau or is decreasing due to having more resources and interventional programs on the care of cancer patients. The opposite is seen in the developing Pacific Island countries.

In Papua New Guinea(PNG), during a thirty-year retrospective study from the cancer registry since 1958, Sengupta and colleagues [5] reported an incidence of 2.7/100,000 in 1990.Ten years later, Halder and others [6] reported an increase to 6.9/100,000 in 1998. This rate has unequivocally increased to 45.8 per 100,000 in 2018with a high mortality rate of 25.2 per 100,000 [4].During the primary study, Sengupta et al [5]noticed age specific increase in age group of 40 to 49 years, but it was a younger age group in 35 to 45 years in the study by Halder [6].

While it is refreshing to know about the current statistics, PNG did not have a proper cancer registry of all cancer patients since the early 1980s when it was improperly managed and ceased reporting and archiving. The most recent figures suggest an estimated trend projected from the past or as per case reporting from few individual hospitals.

Pathology of Breast Cancer:

The most common breast cancer presentation among the Pacific Island

women including PNG is abreast lump with invariable sizes. In a prospective study of women with breast lumps at Port Moresby General Hospital (PMGH) between 2008 to 2015Waine et al [7] found that 60% of women presenting with a breast lump have confirmed histology diagnosis of cancer. Other causes of breast lumps are mastitis, breast ulcer, infection with abscess and discharging nipple [7].

Sixty six percent of the histological diagnosed breast cancers were invasive ductal carcinoma. Others in descending order were poorly differential carcinoma (6.8%), medullary (5.7%) and adenocarcinoma (5.4%) of the breast [8]. Age specific group with high incidence in PNG is between 30 to 45 years. Most are otherwise premenopausal [8]. In PNG, a young age woman who presents on first visit to the clinic with clinical breast lump size or grading of 2B (2-4 cm size lump) has about 65.2 % chances of developing metastasis [7]. Again most of this will be based on each case report or on incidental reporting and a similar observation was said for the other Pacific Islanders [9]. During the recent past twenty years, Fiji has started creating a central cancer registry for other pacific island countries where reporting is coordinated. Their statistics are about the same as seen in PNG [9].

Etiological Risk factors:

There are few main features that delineate women in the Pacific Islands from the western world on risk factors associated with breast cancer. Understanding this provides the main component of the health awareness and educational aspect of cancer in the family and communities. It has been shown that there is an association between diets, mostly introduced high fat western diet, with breast cancer. Lack of physical exercise and fertility are also known factors associated with increased breast cancer incidence [10-14] especially in woman living in medium and low income countries within the Asia Pacific region [15].

Most Papua New Guinean women and other Pacific Islanders usually live a traditional lifestyle, in which their diets are mostly traditional foods and less westernized foods. Most times these women are physically active until their late forties (Average Life span is 58 years) [16]. These women would have married early and have many children [16]. Menarche for them starts late while menopause sets in early thus, their exposure to estrogen is rather short compared to most women from other regions and women from the developed world [17, 18].These factors have generally been attributed to less predictive association with breast cancer incidences.

Early menarche, late menopause, older age at first delivery, and a lower number of full term pregnancies are also associated with higher incidence of breast cancer [2]. Case control studies have shown positive relationship on this reproductive behavioral pattern on breast cancers in most Asian women and have recently been shown for Pacific Islanders as well [19-23]. This fertility pattern is on the rise, [14] especially with the concurrency of family planning usage among young women in the region which increases susceptibility to develop breast cancer [24].

Pip et al [25] noted that about 54% of their study population in PNG had negative receptor markers for both progesterone and oestrogen. Only about 4% had positive receptors for both hormones. In comparison, American whites had 20% and

blacks 35% negative receptors for both hormones and positivity for both hormone receptors were 60 and 44% respectively [25]. While most Asia-Pacific women with breast cancer have a high tendency to have progesterone and estrogen receptor negative (PR- / ER-) cancers [15,26], recent studies in Malaysia are now showing that ER +ve is now increasing in breast cancer at a rate of 2% every five years [27]. Other lifestyle risk factors that are associated with breast cancer are [28]; smoking [29, 30] excessive alcohol intake [30-32] and a very high body mass index [33, 34].

Genetic factors between family relationships are known as a positive correlation. The risk of developing breast cancer is higher if a mother, sister or daughter has had breast cancer [2]. Hereditary breast cancer is commonly due to a mutation in the BRCA1 and BRCA2 genes [35]. Particular ethnic groups may also have a greater risk of developing breast cancer due to the high prevalence of the BRCA1 and BRCA2 gene mutation [36-38]. Together with the life style and fertility factors, the combined risk is greatly increased.

National Health System (Government):

The national Government of PNG through the health department adopted the national health plan for year 2010 to 2020. Key Result Area 7 states "Promote healthy lifestyles and reduce morbidity and mortality from non-communicable diseases such as cancer" [39].The policy emphasis is on the need for primary and preventive health care. Therefore there is less allocation of resources to the secondary and tertiary care of cancer in general. Funds allocated for cancer promotion and services are minimal that even the only radiation cobalt machine in the country has been nonfunctional and has not been attended to for the past five years. There was a long period from late eighties to the year 2005 where the same machine was idle without any use. Medications are infrequently supplied to hospitals and surgery may even take a longer time.

There are about eight pathologists working in the main tertiary hospital (i.e. Port Moresby General Hospital) servicing about eight million populations. All pathological specimens are often screened here by these specialists and most often it gets massively tedious. This type of cancer services is typical for any developing or low income country in the Pacific, excluding Australia and New Zealand.

Breast cancer screening:

Mammography is limited to a lot of low to medium income countries, [40] and where there is availability; its superiority to clinical examination in screening for breast cancer is known [41]. In least developed countries, Self-breast examination and its awareness among women is highly encouraged and continue to be maintained as the best screening option. Self-breast examination is cheap, practical and can be done at home situation. In addition more women must be encouraged to seek early help at the health facility [43, 44].

Management of breast cancer:

Management of breast cancer and any other cancer in PNG and the Pacific Islands countries are always suboptimal. Poor resources for cancer services and patients' dynamics have together resulted in extremely poor outcomes. Therefore about 70% of deaths from cancer occur in low-middle income countries [2] and the

Global burden of cancer is now occurring in these countries [44].

Ideal management of breast cancer requires a multidisciplinary team, comprising the breast surgeon (mostly general surgeon in the Pacific Islands), radiologist, pathologist, radiation and medical oncologists, and a breast care nurse. It also depends on a robust and equitable health care system, with adequate staffing and resources to provide optimal treatments [2]. Most if not all are wishful items for most Pacific Island countries. While the management of cancer is not straight forward in most countries, understanding the cancer biology, public health awareness, socio-cultural and lifestyle adjustment are but feasible and easier to manage [45].

Summary facts about cancer care in PNG and the Pacific Island countries:

Managing a cancer patient in a resource limited country like PNG, one needs to understand basic but very important facts about the dynamics involved in the care [15, 40,46]. The list below shows variables that are generally common for PNG and other small Pacific Island countries and forms the main core of the public awareness.

Variables
Early detection
Access to optimal treatment
Inadequate diagnostic facility and treatment
Lack of education and awareness
Geographical isolation
Competing health care needs
Traditional remedy
Cultural and economic factors may hinder the survival outcome; for example: misunderstanding about the disease process like surgery may help spread the diseases quickly and may cause death too soon
Other social implications such as negative perception that post mastectomy burden to family can cause reluctance, fear and denial for further treatment

Most scores with negatives on the list will always result in delayed presentation, advanced disease stage with large tumors and invariant histology grading, local and regional lymph nodes involvement are common and distant metastasis [40,47]. These are typical features for PNG and Pacific Islanders.

International Programs:

The World Health Organization (WHO) [48], International Agency for Research on Cancer (IARC) [49] and International Association for Cancer Registries(IACR)

[50] together aim to unify the cancer registration for cancer patients throughout the world. Such programs will promote uniformity of data and monitoring of cancer patients throughout the region. Although in PNG a cancer registry started in 1958, it has never continued. Cancer management is adhoc and data are never standardized. Meetings to rectify these have been ongoing and the establishment should take priority.

Other pacific islands have their central registry in Suva, Fiji. Data is kept there and coordination is done through the central registry. Recently it has an ongoing program supported by the international body and foreign aid from Australia and New Zealand.

The Breast Health Global Initiative [51] was set up in 2003 by the Fred Hutchinson Cancer Centre in Seattle, USA. The aim was to develop economically feasible and culturally sensitive guidelines for breast cancer care in low and middle-income countries. These guidelines cover the whole spectrum of breast cancer control (prevention, early detection, diagnosis and treatment).

The guidelines are feasible and convenient and are stratified into four (4) types: basic, limited, enhanced and maximal segments depending on their sources that are available. The aim of this stratification model is to ensure in low resource settings, that women with breast cancer are managed appropriately [52, 53].However, such initiatives may not achieve its primary objective if local data collections and data recording are not done. This is one of the biggest obstacles in cancer care in PNG and the Pacific Island countries [54].Many such projects initiated and funded by international organizations for the betterment of the local cancer population can only survive and serve its purpose when the local host country takes ownership of the program. Despite many obstacles and local programs in disarray, there are always challenges in PNG and the Pacific countries to provide optimum care for the breast cancer patients. Otherwise many of these low to middle income countries will continue to provide the burden to the global cancer care programs.

CONCLUSION:

Care of breast cancer and other cancers in PNG and the Pacific Island countries have their own unique challenges and the same cannot be said for other developed countries within the region. However, it requires taking ownership of the programs, simple but effective awareness about the public health and lifestyle and in addition, early and basic regular health checks are important to decrease risk of cancer in our communities.

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