

MINI-REVIEW

Epidemiology of Breast Cancer in Malaysia

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Abstract

Data from the National Cancer Registry of Malaysia for 2004 provide an age-standardised incidence rate (ASR) of 46.2 per 100,000 women. This means that approximately 1 in 20 women in the country develop breast cancer in their lifetime. However, the rate differs between the three main races, the Malays, Chinese and Indians. The age standardized incidence in Chinese is the highest, with 59.7 per 100,000, followed by the Indians at 55.8 per 100,000. The Malays have the lowest incidence of 33.9 per 100,000. This translates into 1 in 16 Chinese, 1 in 16 Indian and 1 in 28 Malay women developing breast cancer at some stage in their lives. The commonest age at presentation is between 40-49 years, with just over 50% of the cases under the age of 50 years, 16.8% below 40, and 2% under 30. Some 55.7% of all cases were found to be ER positive. The commonest presenting symptom was a lump in the breast in over 90% of cases, generally felt by the woman herself. The mean size of the lump was 4.2 cm, and on average, the women waited 3 months before seeking medical attention. Over the 12-year period from 1993 to 2004, about 60-70% of women presented with early stage (Stages 1- 2) while 30-40% presented with late breast cancer (Stages 3-4). Especially Malays present at later stages and with larger tumours. Consequently their survival is worse than with Chinese and Indian women. The challenge in Malaysia is to be able to provide a comprehensive service in the diagnosis and treatment of breast cancer, and this requires training of a team of health professionals dedicated to breast health, such as breast surgeons, radiologists specializing in breast imaging, breast pathologists, plastic surgeons specializing in breast reconstruction, medical and radiation oncologists, psycho-oncologists, counselors, and breast nurses. Advocacy can play a role here in galvanizing the political will to meet this challenge.

Key Words: Breast cancer - Malaysia - epidemiology - comprehensive control

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World Incidence of Breast Cancer

Breast cancer is the commonest cancer in women in most parts of the world. The number of newly diagnosed cases in the year 2002 was estimated to be more than a million, and there were more than 400,000 deaths world-wide. There is a marked geographical variation, with the highest incidence in northern Europe and North America, intermediate in southern Europe and South America and lowest in Africa and Asia (Figure 1). The age-standardised incidences range from 95 per 100,000 in the more developed countries to 20 per 100,000 in those less developed (Parkin et al., 2005). In Asia, there has been a rapid increase in the incidence of breast cancer in recent years, and the disease may occur at a relatively young age (Moore et al., 2003).

As well as the large variation in the incidence, there is also a wide variation in the mortality and survival between different countries and regions and also within specific populations. Many complex factors underlie these variations, including population structure (age, race, and ethnicity), lifestyle, environment, socioeconomic status, risk factor prevalence, mammography use, disease stage at diagnosis,

and access to high-quality care. Further research is needed to fully understand the reasons for variation in breast cancer outcomes and to aid in the development of tailored strategies to improve outcomes in general as well as the standard of care for underserved populations and reduce the burden of breast cancer worldwide (Hortobagyi et al., 2005)



Figure 1. World Variation in Breast Cancer Incidence

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It has been noted that during the past decade that there have been signs of a sustainable decrease in mortality rates in a number of western-lifestyle countries. This represents considerable progress in breast cancer control and, although different factors contribute to different degrees in different countries, is mainly due to increased breast awareness, earlier detection and the delivery of the most appropriate therapy to women with the disease (Boyle, 2005).

The prognosis from breast cancer is generally rather good, as illustrated by the estimated survival rates - the average in developed countries is 73% and in developing countries 57%. As a result, breast cancer ranks as the fifth cause of death from cancer overall, although still the leading cause of cancer mortality in women (the 411,000 annual deaths represent 14% of female cancer deaths). The very favorable survival of breast cancer cases in Western countries (89% at five years, in cases registered by the US SEER Program in 1995–2000) is also a consequence of the presence of screening programs (Parkin et al., 2005).

Because of its high incidence and relatively good prognosis, breast cancer is the most prevalent cancer in the world today; there are an estimated 4.4 million women alive who have had breast cancer diagnosed within the last 5 years (compared with just 1.4 million survivors—male or female—from lung cancer). It has been estimated that 1.5% of the US female population are survivors of breast cancer (Parkin et al., 2005).

Incidence of Breast Cancer in Malaysia

In Malaysia, until the National Cancer Registry (NCR) was launched in June 2003, there was a lack of incidence data on cancers. In 2003, 3738 new cases of breast cancer were reported to the NCR of Malaysia, giving an age-standardised incidence rate (ASR) of 46.2 per 100,000 women. This means that 1 in 20 women in Malaysia will develop breast cancer in their lifetime. However the rate differs between the three main races, the Malays, Chinese and Indians. The age standardized incidence in Chinese is the highest, with 59.7 per 100,000 followed by the Indians at 55.8 per 100,000. The Malays have the lowest incidence of 33.9 per 100,000. This translates into 1 in 16 Chinese women, 1 in 16 Indian women and 1 in 28 Malay women will develop breast cancer at some stage in their lives (Lim and Halimah, 2004).

Because of the different age population structures between different countries and even between different races in the same country (Figure 2), age-standardized incidence

Table 1. Risk Factors for Developing Breast Cancer

Increasing age
Geographic location
Family history
Reproductive factors
Early menarche less than 11 years
Late menopause more than 55 years
Nulliparity
Late first child-birth more than 30 years
Carcinoma of the uterus
Carcinoma of the ovary
Dietary factors – diet rich in animal fats
Exogenous hormones - Oral contraceptives
Hormone replacement therapy
Alcohol – more than 2 drinks pre day
Postmenopausal obesity
Higher socio-economic group
Limited breast feeding (for long periods is a protective factor)

rates need to be standardized according to the world standard population. Where the majority of the population is young, incidences are naturally higher than the crude rate.

The difference in incidence rates between the Malays and Chinese can be explained in terms of the risk factors known to be associated with breast cancer (Table 1). The Chinese are more likely to have fewer children, have their first child later, and also to breast-feed for shorter periods compared to the Malay women. Other risk factors in the Chinese could be related to their generally higher socioeconomic status and diet, with a possible influence of genetics. However, there are currently only limited data on the genetics of breast cancer in Malaysian women, and this is the rationale for the on-going study by the Breast Cancer Research Initiatives Foundation (CARIF) in the country. There is also a possibility of under-reporting in Malay women because they are more likely to seek alternative therapy and hence not present to the medical practitioner.

Because the NCR in Malaysia has only been in existence since 2002, it is not possible to determine time trends. However, in other Asian countries where cancer registries has been in existence for many years, a sharp increase in incidence rates has been noted. For example, an increase of 3.7% per annum in the incidence of breast cancer was seen in Singapore from 1968 to 1997 (Parkin and Fernandez, 2006). This unfavorable trend is due in part to increases in risk factors (decreased childbearing and breast-feeding, increased exogenous hormone exposure, and detrimental dietary and lifestyle changes, including obesity and less physical activity).

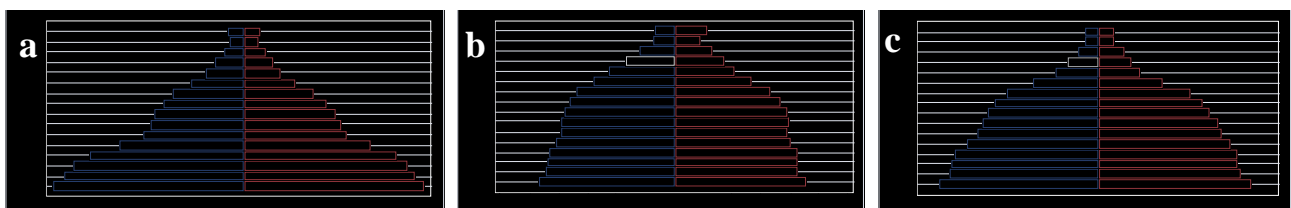


Figure 2. Ethnic Population Pyramids for Malays (a), Chinese (b) and Indians (c) in Malaysia (males and females on the left and right)

Table 2. Female Breast Cancer Age Incidence in Malaysia (NCR Report)

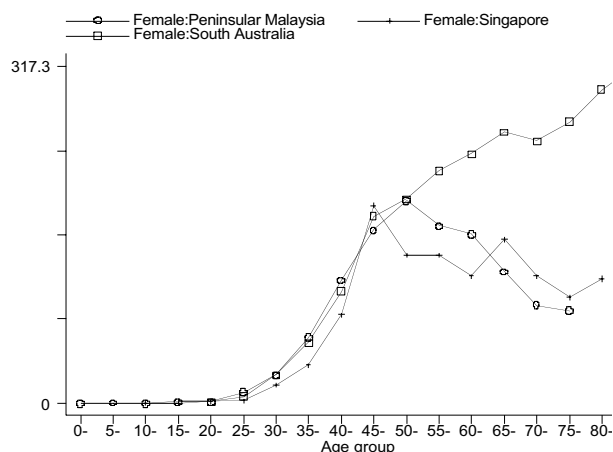
Age	No	%	CR
0-9	2	0.1	0.1
10-19	5	0.1	0.3
20-29	39	1.0	2.5
30-39	457	12.2	34.1
40-49	1255	33.6	111.9
50-59	1141	30.5	159.8
60-69	571	15.3	137.7
70+	268	7.2	97.9

CR, cancer incidence rate/100,000

Of the 3,738 cases of breast cancer seen in Malaysia in 2003, about 50% were below the age of 50 years, with 40-49 year olds as the prevalent age group, accounting for more than 30% of the cases. However the highest incidence rate was in the 50-59 year age group, after which the incidence rate dropped (Table 2). The mean age was 48.1 years in Malays, 51.4 years in Chinese and 52.3 years in Indians. It is difficult to explain the younger age in Malay women; it could be because the older Malay women are in the rural areas and may opt for traditional medicine and hence be unreported, since reports to the NCR are by doctors and not lay people. Another reason could be the difference in the population structure between the Malays and the other races, Malay women having a higher fertility rate and there are more Malay women in the younger age groups compared to the other races.

Differences in Incidence and Age at Onset Between Developed and Developing Countries

When compared to data in the developed countries such as USA and Europe, the incidence of breast cancer in Malaysia is less than half that of USA. The lower incidence in Malaysia and other countries in Asia and Africa could be due to the differing risk factors associated with lifestyle, reproductive factors and diet. Breast cancer is a cancer of the affluent countries, and the incidence rate increases with industrialization and economic development. The fact that

**Figure 3. Age-dependent Incidence of Breast Cancer**

the mean age at onset in Malaysia and other developing countries is lower than that in the developed countries, where the mean age is 60 years, could be partly due to the population structure where the major proportion of the population in developing countries is young; in fact the median age of Malaysians is only around 24 years old.

However, when we look at the age-specific incidence which is independent of the population structure, we find that the age-specific incidences in Malaysia and other developing countries decrease after 50-59 years old, whereas in developed countries, they continue to rise (Figure 3). This could be due to a "cohort effect" where succeeding generations of women are exposed to differing risk factors. (Yip and Ng, 1996). The generation of women born after the second world war has successively higher risk of developing breast cancer. This could be explained by the fact that many of the risk factors for developing breast cancer act in childhood and adolescence, like age at menarche, which is related to growth and development in childhood, which again is linked to nutrition. Hence rising incidences of breast cancer in the developing countries, which are progressing towards a more developed country lifestyle, could be related to better nutrition in childhood. It is worth noting that the incidence in Japan has remained low despite the fact that it is a developed country, and this could be related also to dietary intake.

Stage at Diagnosis of Breast Cancer in Malaysia

Unfortunately, the stage at diagnosis is not available from the NCR data. What we know about stage at diagnosis can therefore only be obtained from hospital epidemiology data, which may differ between hospitals. In the University Malaya Medical Centre, the number of newly diagnosed cases of breast cancer increased from just over 60 cases in 1993 (when the Breast Clinic was started) to over 330 in the year 2004. The commonest age at presentation was between 40-49 years, with just over 50% of the cases under the age of 50 years, 16.8% below 40, and 2% under 30. Some 55.7% of all cases were found to be ER positive.

The commonest presenting symptom was a lump in the breast in over 90% of cases, generally felt by the woman herself. The mean size of the lump was 4.2 cm, and on average, the women waited 3 months before seeking medical attention. Over the 12-year period from 1993 to 2004, about 60-70% of women presented with early stage (Stages 1-2) while 30-40% presented with late breast cancer (Stages 3-4). This compares unfavorably with Western countries, where more than 80% of women present with early stage lesions, and the mean tumour diameter is 2 cm. In 2004, among the 3 races in Malaysia, the Malays tended to present with later stages, some 40% with Stage 3 and 4, while this was the case for only 15% of Chinese, and 20% of Indians.

The Penang Cancer Registry (which is a regional cancer registry) reported that Stage 1 breast cancer comprised only 15.8% of cases from 1994-1998, while Stage 2 accounted for 46.9%, Stage 3 for 22.2% and Stage 4 for 15.5% (Zariyah

Table 3. Breast Cancer in Hospital Kuala Lumpur Compared with the University of Malaya Medical Center

	HKL (n=774)	UMMC (n=1485)
Stages 3-4	50-60%	30-40%
Malays	48%	23%
Chinese	35%	59%
Indians	17%	16%
Size	5.4 cm	4.2 cm

et al., 2003). With the Hospital Kuala Lumpur (HKL), 50-60% of breast cancers presented at the late stages (Hisham and Yip., 2003; 2004) It is interesting to note that the majority of patients in HKL are Malays while the majority of patients in UMMC are Chinese (Table 3). Hence it appears that in Malaysia, the stage at diagnosis of breast cancer varies between hospitals and also between regions.

Survival from Breast Cancer in Malaysia

There is wide variation mortality data from breast cancer world-wide. The 5-year survival is much higher in the richer, developed countries compared to the poorer developing countries in Asia and Africa. In Malaysia, mortality data are generally unreliable because only 40% of deaths are medically certified and in the majority of cases the responsible people are laymen, such as the police and village headmen. Hence the five-year survival in the whole country is generally unknown.

UMMC has maintained a breast cancer registry since 1993. From 1993 to 1997, the national identification number (IC No) of patients with breast cancer registered in UMMC (those who defaulted treatment were excluded) were checked with the National Registry Department to determine whether they were alive or dead. This gives the most accurate estimation of mortality in this group of patients as all deaths have to be registered. With technical help from the Department of Mathematics in the University of Malaya, the overall 5-year survival from breast cancer in UMMC was computed to be 58, with Malay women having a poorer survival with 45.9% 5-year survival, Indians with 57.1% 5-year survival and Chinese with the best survival of 63.2%. The survival was also dependent on the stage at diagnosis, Stage 1 had the best survival of 81.7%, Stage 2 with 72.4%, Stage 3 with 39.9% and Stage 4 with 12.9%. Since Malay women come with later stages compared with the Indian and Chinese women, it is not surprising that they exhibit poorer survival.

Hence the overall 5-year survival from breast cancer in UMMC correlates well with the average of 57% in developing countries. Looking at survival according to stage at diagnosis, it is clear also that early diagnosis is associated with a better survival. The survival of 81.7% in Stage 1 disease could be further improved by improved treatment, as it is now possible to obtain a survival of 90% or more. If survival is mainly dependent on early diagnosis and treatment, these are clearly the areas that we need to work on to improve the outcome from breast cancer.

Early Detection of Breast Cancer in Malaysia

Generally, Malaysian women present with later stages of breast cancer compared to their counterparts in the developing countries. Early detection could be promoted by screening, and the methods of screening for breast cancer are available, these being mammography, clinical breast examination and breast self examination. Screening in Malaysia is very much opportunistic in nature, and targets women attending women's wellness clinics, and, maternal and child-health clinics run by the Ministry of Health. Pap smears are offered to women at these clinics to screen for cervical cancer, and clinical breast examination is carried out. Breast self examination is also taught to women attending these clinics by public health nurses. However, there is no national mammography screening programme for early detection of breast cancer. Mammography screening remains under-utilized, and is very much based on women taking the initiative to self- refer themselves for screening.

A Ministry of Health survey in 1996 showed that only 46.9% of women reported having some form of breast examination, either breast self-examination, health-worker examination or mammography. Only 3.7% of women had a mammogram performed. Lower rates are found among rural women, while married women had a significantly higher screening rate than the other marital categories of women. Screening rates were found to be highest among those aged 20-49 years.

When mammography screening programmes started in several developed countries, breast self-examination was not encouraged. However, in developing countries with no resources for mammography screening, breast self-examination has been recommended (and is still being promoted) as the most appropriate method of early detection of breast cancer as several previous studies have shown that women who practice BSE were more likely to be diagnosed with early stages of breast cancer (Hill et al., 1988). However a controlled trial of 266,064 Chinese women randomized to BSE or no BSE found that after 10-11 years of follow up there was no difference in breast cancer incidence or mortality rates between the two groups (Thomas et al., 2002). Furthermore, a recent meta-analysis of trials of BSE training showed that BSE was associated with considerably more women seeking medical advice and having biopsies, but was not an effective method of reducing breast cancer mortality (Hackshaw and Paul, 2003).

Health education programmes have to target the population subgroups that would most benefit from screening, including women in the older age groups. One strategy would be to encourage both Pap smear and breast examinations being performed simultaneously. Mammography as a population-based screening procedure for breast cancer is not a policy in Malaysia at present as its value is expected to be negligible with the limited resources at present. Currently the Department of Family Health, which is part of the Ministry of Health, has formed a

technical committee to look into a pilot mammography screening project in Malaysia, for the purpose of assessing feasibility of introducing mammography screening for the whole country in the future.

Treatment of Breast Cancer in Malaysia

Multidisciplinary efforts in cancer care are essential, requiring a team of specialists working together to provide the best therapy for the patient with cancer. For breast cancer, the treatment requires a surgeon, a radiologist, a pathologist, radiation and medical oncologists, plastic surgeons, oncology nurses and counselors. However, in almost all hospitals, experts in most of these specialities may not be available at present.

In 1993, the Ministry of Health decided to set up breast clinics in all the major hospitals to provide a comprehensive and integrated care to women with breast complaints. Unfortunately, the development of breast clinics throughout the country has stagnated due to lack of resources and manpower in every category. The formation of a breast clinic requires a parallel development of a number of other specialities, including pathology, radiology, oncology, plastic surgery and speciality nursing, which are also lacking (Lim, 2002; Hisham and Yip, 2003; 2004)

There continues to be lack of cancer treatment facilities in Malaysia. There are only 21 cancer treatment centres (where radiotherapy is available) in the country, of which 6 are in the public sector (Ministry of Health and Universities) and 11 are in the private sector. Geographically, the distribution of these centres is unequal with 12 concentrated in the national capital of Kuala Lumpur and its surrounding areas.

Since the majority of these centres are in the private sector where treatment cost is high and may not be affordable, the few centres in the public sector are overloaded and waiting lists are long. In 2000, the Quality Assurance Committee in Hospital Kuala Lumpur (HKL) reported that the waiting time for radiotherapy treatment in HKL was 5-8 weeks. This falls short of the 2-3 weeks waiting time recommended by WHO. The total number of radiotherapy machines (linear accelerators) is 5 in the public sector and 14 in the private sector giving a treatment machine ratio of 1.2 LINAC per 1,000,000 population in Malaysia. This is also fewer than the 2 per 1,000,000 ratio which is the WHO recommendation.

The total number of oncologists in Malaysia in 2003 was 35, giving an oncologist:population ratio of 1:650,000. This should be compared to the United Kingdom where the oncologist:population ratio is 1:250,000. Almost all these oncologists are clinical oncologists, that is, they are both radiation and medical oncologists together. Added to this problem, the majority of them are in the private sector, only 12 of the total working in Ministry of Health and university hospitals. Hence a major challenge in Malaysia remains regarding provision of a comprehensive service for the diagnosis and treatment of breast cancer.

Conclusions

In conclusion, breast cancer is the commonest cancer in Malaysian women. The incidence is higher in Chinese and Indian women compared to Malay women and this difference could be due to reproductive, environmental and dietary factors. The prevalent age group is the 40-49 year age group and more than 50% of cases below the age of 50 years. Women in Malaysia, especially Malay women, present at later stages and with larger tumours compared to their western counterparts. Consequently the survival in Malay women is worse than with Chinese and Indian women.

Survival from breast cancer, as well as being a function of the stage at diagnosis, is also dependent on high-quality treatment, based on the best evidence. For this purpose clinical practice guidelines should be developed, updated regularly and implemented. As well as a local clinical practice guidelines which has been published by the Ministry of Health together with the Academy of Medicine (2002), there have been international efforts to develop clinical practice guidelines for management of breast cancer in developing countries stratified according to the level of facilities available in each country (Anderson et al., 2006).

The challenge in Malaysia is to be able to provide a comprehensive service in the diagnosis and treatment of breast cancer, and this requires training of a team of health professionals dedicated to breast health, such as breast surgeons, radiologists specializing in breast imaging, breast pathologists, plastic surgeons specializing in breast reconstruction, medical and radiation oncologists, psycho-oncologists, counselors, and breast nurses. Advocacy can play a role here in galvanizing the political will to meet this challenge.

Finally, breast cancer education is very important in Malaysia and the messages to women should be the following:

Breast cancer can be cured if detected and treated early

The methods of early detection are mammography, breast self examination and clinical breast examination

With early detection, a mastectomy may not be necessary

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