Reducing by half the percentage of late-stage presentation for breast and cervix cancer over 4 years: a pilot study of clinical downstaging in Sarawak, Malaysia

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Background: The registry of the Oncology Department in Sarawak General Hospital showed that 79% of nasopharyngeal, 77% of breast and 70% of cervix cancer patients were diagnosed at an advanced stage (stages III and IV) for year 1993. Hence, a low cost Early Cancer Surveillance Program was started in 1994, with the intent of downstaging these three most common cancers in Sarawak.

Materials and methods: The program consisted of (i) training health staff in hospital and rural clinics to improve their skills in early cancer detection, (ii) raising public awareness through pamphlets, posters and sensitization by health staff.

Results: Data analysis revealed that the program achieved downstaging in two of the cancers. Breast cancer in stage III and IV was reduced from 60% (1994) to 35% (1998) (P < 0.0001) and cervical cancer in stage III and IV from 60% (1994) to 26% (1998) (P < 0.0001). No reduction was observed for nasopharyngeal cancer at 88% (1994) to 91% (1998).

Conclusions: The overall cost of this program was <US$34 000. It is cost-effective and easy to implement and would be a valuable alternative in countries where majority of the tumors are found in late stage (III and IV) where screening programs meet important difficulties. Our data analyses revealed important shortcomings in the PAP smear screening program where inadequate groups of women were screened. It resulted in a pick up rate of only 5% of the cases. This finding confirmed the need for the simple and complementary downstaging approach.

Key words: breast cancer, cervix cancer, clinical downstaging, NPC

introduction

Clinical downstaging consists of screening for cancer using clinical approaches to detect the disease earlier. It has to be distinguished from the application of a screening test that results in the detection of disease at a less advanced stage, ideally before the appearance of symptoms. Clinical downstaging is intended to make use of the available health care resources in an area to improve the stage distribution of diagnosed cases. The theory of downstaging is not new and has been carried out in some developing countries where late presentation of cancer is the major feature [1]. Downstaging includes (i) training of health professionals at all levels to be alert to the signs and symptoms of cancer and (ii) instituting campaigns to make the public aware of the symptoms of the disease and of the benefits of early diagnosis. Where adequate treatment is available, it is essential that there be a mechanism for detecting the disease at an early stage and referring patients for treatment early.

Cervical cancer is perhaps the most curable form of any human cancer if detected at the precancerous stage, and any cancer control program in a country where cervical cancer is an important cause of morbidity and mortality should include measures to promote early detection of this disease. There is good evidence that mortality from cancer of the cervix was declining in many countries before cervical cytology programs were introduced. This appears to have been due to increased public education, awareness of the importance of early detection and professional specialization that led to formation of effective diagnostic and therapeutic teams that did not depend on screening [2].

The incidence of breast cancer is lower in developing countries than in developed countries, but the stage at presentation is much later. In many developed countries, organized mammography screening is available at the
population level while developing countries lack such facilities. An ideal screening test for developing countries needs to be simple, inexpensive and effective. Mammography is far from reaching these criteria. Hence, breast self-examination and clinical breast examination (CBE) to detect any abnormalities have been envisaged as alternatives. Although there is inadequate evidence that physical examination of the breast as a single screening modality reduces mortality from breast cancer [3], there are indications that good clinical breast examinations by specially trained health workers could have an important role. These come from the HIP study where mammography detected a low proportion of breast cancers, especially in women under 50 [4], yet breast cancer mortality was reduced. Similarly, in the Canadian National Breast Screening Study, the addition of mammography to such examinations in women aged 50–59 did not result in a reduction in breast cancer mortality [5].

Early diagnosis, referral and treatment of nasopharyngeal cancer (NPC), breast and cervical cancers are of far greater prognostic importance than any attempts to treat the disease in its late stages. This paper presents the program instituted in 1994 in Sarawak, which aimed at decreasing the stage at presentation for these three cancers.

**background**

The Malaysian state of Sarawak situated in the western north part of the island of Borneo (Figure 1) has a population of two million inhabitants. In this State, chemotherapy and radiotherapy are available in only one location: the Department of Radiotherapy and Oncology (DRO) at the Sarawak General Hospital (SGH) in Kuching. The DRO has two oncologists and one physicist and is the only referral center for the management of cancer in Sarawak. Because of its special situation detailed later, the DRO’s registry provides data which can be considered as an acceptable representation of the cancer situation in the population of Sarawak. The top five cancers at DRO in 1993 were NPC, breast, cervix, lung and colon. Analysis of the data on NPC, breast and cervix cancers for the year 1993 showed that 79% of nasopharyngeal, 77% of breast and 70% of cervix cancer patients were first diagnosed at an advanced stage (stages III and IV). In addition, the results revealed that the peak age group for the two female cancers was between 40 and 50 years of age (Figure 2). Before 1994, the only form of cervical cancer screening in Sarawak was the PAP smear. The PAP smear program was started in the 1960s. This program mainly involved women who attended...
Maternal and Child Health clinics during the antenatal and postnatal checkup; hence it was opportunistic in nature. In view of the findings on the late presentation on the three cancers and considering that they were amenable to early detection, the DRO and the State Health Department decided to setup a simple and cost-effective new program aiming at achieving downstaging for NPC, breast and cervix cancer. This program mainly consisted of training for health staff in the rural areas to improve their skills in Early Cancer Surveillance. In this program, we considered that early stage includes stage I and II and late stage includes stage III and IV. Tumor–node–metastasis staging was used for cancer of the breast and nasopharynx and International Federation of Gynecology and Obstetrics staging was used for cancer of the cervix.

**Materials and methods**

**Early Cancer Surveillance program**

Between January 1994 and end of 1999, the community nurses from the 154 rural clinics of Sarawak and the health staff from the 18 district hospitals of Sarawak were trained for two days in the theoretical and practical aspects of NPC, breast and cervix cancer. The staff trained was responsible for a population of approximately one million. The training team consisted of a coordinator, a clinical oncologist, an ENT surgeon, a gynecologist and six female and two male nurses. The trainees were made aware on the importance of early treatment with emphasis on cure for early-stage disease and good palliative care for later stages. The main objective of the training was to ensure proper mastery of different techniques: PAP smear and visual examination, clinical examination of the breast (CBE), teaching breast self-examination to women, head and neck examination for neck nodes and paranasal examination (PNSE) using the laryngeal mirror. In all, ~400 health staff were trained.

The program also included strengthening of public awareness. This was achieved by distribution of pamphlets and posters (three posters per clinic/hospital) in various local languages that aimed at motivating patients to go to the nearest rural clinic if specific symptoms were present. In addition, as part of their routine duties, the community nurses of rural clinics were instructed to hold a health education talk and discussion on the subject during one of their monthly visits to the villages under their jurisdiction. During these visits they would teach the village people about the early signs and symptoms of the three cancers. Breast self-examination was taught to all women, and CBE and PAP smears were carried out when women were agreeable. PNSE were carried out when signs of NPC were present. A system for referring the positive cases for treatment was also strengthened, mainly by allowing nurses from the rural clinics to refer cases to the district hospitals. The budget used for this program was US$ 8000/year for health staff training (mainly for the travel cost for the trainers, salaries are excluded) and US$ 1250 for pamphlets and posters.

**Results**

**Clinical downstaging**

As shown in Figure 3, the percentage of breast cancer patients presenting for treatment at late stage (stage III and IV) dropped from 77% (69/90) in 1993 to 37% (42/115) in 1998 ($\chi^2 = 17.0; P < 0.0001$). Similarly, for cervical cancer, the late-stage presentation dropped from 70% (47/67) in 1993 to 27% (28/105) in 1998 ($\chi^2 = 31.4; P < 0.0001$). For NPC, the figure shows no change from 79% (84/106) in 1993 to 92% (147/160) in 1998 (nasopharyngeal = 8.9; $P > 0.40$). During the same period, cancers not targeted for downstaging did not display any stage variation at presentation. Between 1994 and 1998, the percentage of late stage remained stable with 93% ($n = 72$) to 91% ($n = 96$).
for lung, 63% \((n = 26)\) to 65% \((n = 26)\) for colon and 66% \((n = 18)\) to 68% \((n = 22)\) for rectum.

We feel that raised public awareness was more efficient than health staff training to achieve the breast and cervix results, all the more so since health staff were rotated or transferred rather rapidly and we were not able to provide multiple training in some of the sites for the period 1994–1998.

inefficiency of the PAP smear program

The DRO’s medical record review for 1993–1999 showed that most of the cervix cancer cases consulted because of symptoms (postcoital bleeding, foul smelling discharge per vagina) questioning the efficiency of the screening program implemented since 1963. This extensive review of all cervix cancer medical records showed that only 5% of the cases got a PAP smear at asymptomatic stage showing that the screening program did not reach its target.

discussion

validity of results

Although the statistics carried out for this analysis were based on a case series, we feel that the bias present in this series may not be sufficient to invalidate the conclusions. The Sarawak patients not seen at the DRO during the studied period would be either wealthy people (who may go for treatment abroad) or people from very remote areas who were too sick to travel at the time they were referred. Only the behavior of this last group may have been altered by the program. By decreasing late-stage presentation, the program may have decreased the number of people too sick to travel, and thus increase the absolute number of cases seen at DRO. This effect may explain the increasing number of NPC cases observed between 1995 and 1998. Such an increase in absolute case number cannot create a false positive result (i.e. spurious increased proportion of early-stage presentation).

To assess the efficiency of the program it would have been adequate to compare stage at presentation in patients from districts where the training had been done and patients from districts where the training had not been done yet. Unfortunately, such comparison was not possible because geographical origins of patients were uncertain (a large proportion of patients do not give their own address but the one of the nearest family member). In order to check if the trends observed for NPC, breast and cervix were not due to increasing global health awareness, comparisons were made with other frequent cancers for which no program had been instituted, and no changes were observed.

Our result shows that clinical approach to downstaging was achievable for cervix and breast cancer but was not successful for NPC. Increased public awareness about the signs and symptoms incorporated with easier referral to doctors helped to achieve these results. As symptoms of NPC mimic

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**Figure 3.** Percentage of patients presented at late stage for nasopharyngeal cancer (NPC), breast and cervix in Department of Radiotherapy and Oncology (DRO), Sarawak General Hospital (SGH) (1991–1999).
certain benign conditions, there is a need for innovative methods for early detection of this cancer and presently a novel approach is being tested in an area in Sarawak which has a high risk population and the preliminary results are encouraging.

**conclusion**

Early cancer surveillance programs including education of public and heath staff can achieve clinical downstaging. The successful downstaging observed here for breast and cervix cancers is a crucial finding that is relevant to developing countries where simple and inexpensive methods could be integrated into existing health care programs. The resultant downstaging should lead to a reduction in mortality for these cancers. Educating women empowers them to self-care and gives them the opportunity to seek treatment earlier. In countries with limited financial and manpower resources, downstaging of cancers is a cost-effective way of tackling the problem of cancer burden.

**acknowledgement**

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**references**