

ADDRESSING THE CANCER AGENDA : HOW HAVE WE MEASURED UP ?

K.A. Dinshaw

Introduction

The health scene today is significantly different with marked improvements in all the vital indicators of health development. But much remains to be done with a substantial unfulfilled agenda for poverty and poor health in our country.

Our health problems with infectious diseases, malnutrition, gastrointestinal infections, respiratory diseases occupying higher priority are different from those in the socio-economically advanced countries. However, the developing world would need to cope with a double burden of disease as infectious diseases compounded by poor living conditions or malnutrition alongside non-communicable diseases i.e. heart disease, diabetes and cancer would remain serious concerns and critical challenges.

As we stand at the threshold of a new millenium, it is imperative to review the specific patterns and pace of cancer, it's enormous burden and our preparedness to meet the challenges in the developing countries.

Global Population Trends

The world's population, according to an UNDP Report, will increase from the current 6.1 billion to 9.3 billion within the next 50 years. Today, India, China, Pakistan, Nigeria, Bangladesh and Indonesia account for half the current world annual population growth of 1.3%. While fertility is expected to decline globally, 88% of world's population growth will still be recorded in the less developed countries, with tripling of the population of the 48 poorest nations. Africa and Asia will experience the largest population growth despite the high toll taken by HIV/AIDS. The European population, on the other hand, is expected to start declining as early as 2003.

Thus, the world population in the future would be significantly larger and concentrated in less developed countries. It would also be substantially aging and more urban. Given this population scenario, combined with possible low levels of economic growth, serious health consequences are expected for the developing world.

Available resources, particularly for cancer, within the developing countries remain grossly inadequate. More than 5 billion people, that is 85% of the world's population in developing countries, account for only 20% of the global gross national product. The most impoverished nations would still need to give the highest priority to basic public health issues, while other developing countries including India, would need to divert more resources to the increasing problem of non-communicable diseases.

Cancer Burden

Globally, the burden of new cases in 2000 was estimated to be 10.1 million representing a 20% incidence over the previous decade with 53% occurring in the developing world. Similarly 56% of the estimated deaths from cancer occurs in the developing world. This is projected by the WHO to dramatically increase to 20 million by 2020 with 70% in the developing world with access to only 5% of the global resources.

The increase in cancer incidence is not only due to an increase in the population size but also due to a dramatic increase in life expectancy, as a result of improved control of many communicable diseases. In India, for example, with a 21.3% growth in the last decade and a life expectancy increase from 32 years to 63 years currently, a rapid aging of the population is predicted - the single most important risk factor for cancer development. It is projected that by 2020, the population of elderly (65+) globally would be around 690 million with 67% from the developing countries. In addition tobacco consumption, newer infections, environmental degradation, diet and malnutrition would all contribute as major factors for the increase in the burden.

In males Lung cancer is the leading cancer site both in terms of new cases as well as deaths, with almost equal contribution. The second most common cancer globally, is stomach cancer with almost

two-thirds of the load is contributed by the developing world, in particular China.

This is followed closely by prostate and colo-rectal cancers. More than three-quarters of cases of prostate cancer and two-thirds of colo-rectal cancer occur predominantly in the developed world. Cancers of the liver, head and neck and oesophagus remain major burdens in developing world predominantly.

In men, in the developing world the 5 leading cancer sites are lung, stomach, liver, oesophagus and head and neck. These sites accounted for more than 55% of the cases diagnosed and almost two-thirds of deaths due to cancer for the year 2000.

Breast cancer remains the leading cancer site overall and the leading cause of death in the developed world. This is followed by colo-rectal, lung, body uterus, ovary and stomach in the developed world.

Cancers of the breast and cervix are the two most important cancer sites and account for one-third of all cases diagnosed in the women of the developing world. This is followed by stomach, lung, and colo-rectal all together accounting for 53% of all cancers diagnosed and 50% of all deaths in women in the developing world in 2000. Cancers of the liver head and neck and oesophagus also affects huge numbers of women in the developing world.

Burden of Cancer in India

It is estimated that there are approximately 2 - 2.5 million cases of cancer in the country at any given time. Nearly 800,000 cases were diagnosed in the year 2000 and 550,000 deaths due to cancer occurred in the Indian population. The tobacco related cancers account for almost a third of cancers diagnosed in head and neck, lung and oesophagus in the Indian population. The two most common cancers of women viz. cancer of the cervix and breast further account for half the cancer burden in Indian women. The heavy cancer toll is due to the fact that 70% present in the clinically advanced stages T3-T4 with catastrophic economic impact.

Prevention of Cancer

From the perspective of a developing country what would be the objectives of a cancer control programme?

It is evident that most common cancers are largely preventable. Tobacco use still remains the most important risk factor and poses the greatest challenge. Cancer of the lung, mouth and pharynx and, to an extent, oesophagus are all associated with tobacco-use. Almost 1.5 million cancer cases of tobacco related sites were diagnosed in the developing world in the year 2000. Upto 75% of lung and laryngeal cancer in men are attributable to tobacco smoking. Similarly a high proportion (66%) of oral cancer is attributable to tobacco chewing. Therefore cancers at these sites are preventable with reduction of morbidity and mortality. Primary prevention with implementation of tobacco control strategies are therefore possible.

Adequate and balanced dietary practices, and changes in preservation and storage practices of food have prevented cancers of the stomach and oesophagus. The role of chronic infection with hepatitis B virus in liver cancer in nearly 50-80% is well established. The role of hepatitis C virus in the etiology of liver cancer to a lower extent of 25% has also been in question.

The hepatitis B vaccine, against chronic hepatitis leading to liver cancer became available in 1982 and has since been used to immunize more than 400 million people. The use of the vaccine could reduce the number of liver cancer by upto 70% in areas of sub-Saharan Africa and eastern Asia including China.

A third potential vaccine under investigation is against *Helicobacter pylori* - The role of which is significant enough to justify research for a vaccine.

Apart from the known risk factors Human Papilloma Virus (HPV), in particular subtypes 16 & 18, has now been established as the sexually transmitted agent responsible for initiating cancer cervix in over 90% of cases in the developing world. Primary prevention by awareness, education regarding healthy lifestyle and sexual practices is feasible and has been proven to be effective.

There is also optimism that the number of cervical cancer cases could ultimately be reduced by introduction of human papilloma virus vaccine. Several vaccines are undergoing trials. Its cost would, however, be a crucial factor in determining the extent of usage in developing countries.

Despite many risk factors associated with the development of breast cancer, barely 50% of cases are accounted for by these known factors. This is one site, which is not amenable to primary prevention as none of the risk factors are easily modifiable to prevent the disease.

The cancer burden of the developing world can thus be largely reduced with implementation of tobacco control strategies, promotion of adequate and balanced dietary practices and reduction of alcohol intake. Increase in awareness and education of the public for pursuing healthy lifestyles would go a long way in the reduction of many common cancers.

In the developing countries, almost 75% of cases present themselves to medical facilities with advanced stage of the disease. Early detection should therefore be an important strategy - through the two principal routes of public education and screening.

Oral cancer, so highly prevalent in countries of the Indian subcontinent, is one site, easily accessible to self-examination of the mouth for early detection by public education.

Feasibility studies of mouth self examination (MSE) carried out in many centres. have yielded encouraging results. However, larger studies are required to evaluate the effectiveness of MSE; i.e. whether education could result in a sustained practice of MSE, resulting in reduction in incidence and mortality from oral cancer.

Screening on the other hand is usually undertaken to identify unrecognized disease where there is usually detectable pre-clinical phase for a common cancer with a high associated morbidity and mortality. Furthermore, the test procedure needs to be acceptable, simple, safe, relatively inexpensive and effective. Effective treatment should also be available once the various preclinical conditions are detected by screening.

In developed countries with well-organised screening programmes cervical cytology has dramatically reduced mortality from cancer cervix. However, this method requires vast resources, a large pool of skilled manpower together with a infrastructure capable of reaching out to a staggering number even if it were only confined to eligible women between the ages of 30 to 59 years.

It is not feasible in the poorer countries with large numbers of women. Nearly 65% of patients present themselves at medical facilities in advanced stages III and IV when the cure rates are much lower. The down staging of the disease by visual inspection would therefore be an effective means of optimizing the impact of available resources.

A study in rural India has been launched by IARC with the Tata Memorial Hospital in Barshi, Maharashtra to identify the most cost-effective cervical cancer screening strategy, suitable for our population. The trial is funded by Bill & Melinda Gates Foundation.

This cluster randomized intervention trial covered in 52 primary health centres randomly assigns 40,000 eligible women (30-59 years) in each arm. The three intervention arms would evaluate either visual inspection of the cervix after application of 4% acetic acid (VIA); cervical cytology; or HPV testing by Hybrid Capture III method. The Fourth control arm would confine itself to health education alone. The final end point would be a reduction in incidence and mortality from cervical cancer. Upto May 2002 nearly 331 screening clinics in 228 villages have been completed with 43,770 women enrolled. The compliance to screening is > 75%. The conclusions based on preliminary early results are encouraging with a higher test positivity rate in VIA (17.0%) in contrast to cytology (9.2%) and HPV (10.4%). This large study supervised by R. Sankarnarayanan, IARC, Lyon, remains important for long term assessment.

Mammography for early detection has long been used as a screening tool in developed countries. It involves sophisticated imaging technologies, complex quality control procedures with enormous cost, in terms of manpower and material resources. In India, 50% of women with breast cancer and 70% of cervical cancers present themselves in late stages, III and IV. It is therefore imperative to find avenues

for down-staging the disease. Further a large proportion of such cancers occur in younger women. This method is, therefore, not suitable for the developing countries.

Physical examination of the breast by paramedical workers as an alternative screening tool for the developing world is being evaluated. The recent Canadian study reported encouraging results which suggested that physical examination if well done could perhaps be as effective as mammography in lowering mortality from breast cancer.

Breast self examination is another inexpensive method. However, early results of 2 randomized trials conducted in Russia and China suggest that this method is not effective in reducing mortality from breast cancer.

With this objective a randomized trial has been initiated by the Tata Memorial Hospital funded by NIH (USA) in the slum areas of Mumbai city. The short term objective is to evaluate low cost technology approaches in down staging these common cancers. The long term goal is reduction in mortality. The interventions being evaluated are physical examination of the breast by trained female health workers along with teaching of breast self examination and visual inspection of the cervix after application with 4% acetic acid.

The study covers 150,000 women between the ages of 35-64 years, over a period of 6 years in 4 cycles of 18 months each and a further follow-up is planned at 10-15 years.

The acceptance rate of women invited to participate in the study was 68% in the intervention arm and 89% in the control arm receiving only health talks. The second cycle of 18 months is in progress with data evaluation awaited.

The Tata Memorial Hospital remains committed to the control of cancer on all fronts. The Department of Preventive Oncology undertakes cancer prevention and education programs in the community with preventive intervention research projects. The department also provides training, guidance and expertise to other

national bodies and institutions desirous of setting-up their own prevention and education programs.

In conclusion, the magnitude of the problem should be given the highest priority of a cancer control agenda of a developing country. With many cancers being eminently preventable, while not easily cured, the emphasis, therefore, should also be on preventing the onset and detecting the disease at an early stage. The National Cancer Control Program in India has illustrated the feasibility of implementing cancer control activities in developing countries, making optimal use of scarce resources to deliver the maximum benefit to the largest number of people.

Reference:

IARC Website - www.dep.iarc.fr (updated 19.04.2001)

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