Brief Communication  An index for assigning priority for cancer control within the health care delivery system in developing countries

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As a result of better control of communicable diseases in the developing countries, life expectancy at birth has risen and the population is increasingly becoming exposed to higher cancer risks. This brief communication shows that the cumulative cancer incidence rate estimated for the age range equivalent to average life span is a suitable index for health planners to determine priorities in the allocation of funds for cancer control.

In developing countries, life expectancy at birth has been increasing over the last few decades and the longer life spans have presented increasingly higher risks of cancer. For instance, in India, the average life expectancy at birth was 32.1 years in 1941–51 when cancer could hardly have been an important health problem, but increased to 41.3 years in 1951–61 and 50.5 years in 1971–81 (1). As the age-specific cancer incidence rates are known to increase substantially in the age groups above 40 years, it can be said that the population in India entered the cancer era after the 1950s. Consequently cancer, which did not figure among the 10 leading causes of death in the 1940s, occupied the 6th and 7th ranks in “all causes of death” for males and females, respectively, in the period 1964–67 in Bombay (2): this shift is continuing upwards (3).

It is clear that the increase in life expectancy (as a result of better control of communicable diseases) has led to the emergence of cancer as an important health problem in the country. There is, however, no simple index to guide health planners in assigning priority for the allocation of funds specifically for the treatment and control of cancer. This brief communication proposes such an index and discusses its application in the context of the situation in India.

Method and discussion

Incidence rate cumulated over average life span

The cumulative cancer incidence rate, which is more directly interpretable as the carcinogenic load due to a specific environment than the age-adjusted rate, is currently being used to assess the cancer risk in a population (4). It has been suggested that these cumulative rates should cover three age ranges: 0–14 years for the study of childhood cancers, 0–64 years when the data for older ages are not reliable, and 0–74 years for assessing the risk over the whole life span. For the developing countries, if the rates were also cumulated over age ranges equivalent to the expectation of life at birth over successive periods, they would indicate quantitatively how the cancer risk changes with increasing life expectancy.

The rates cumulated over average life span, along with the life expectancy at birth for selected periods, are shown for males and females in Table I. These estimates for India have been based on age-specific incidence rates for cancer at all sites reported by the Bombay Cancer Registry for the years 1964–66 and 1973–75 (5, 6). The life expectancies at birth are based on the decennial census surveys (1, 7, 8). In the 1960s in India, the rate cumulated over average life span was 1.51% for males and 1.99% for females. Thus, 1 in 66 men and 1 in 50 women with average life expectancy were affected with cancer. In the 1970s, the corresponding figures were 1 in 42 and

Table I: Incidence rates cumulated over average life span for selected periods in India and the United Kingdom*

<table>
<thead>
<tr>
<th>Country and period</th>
<th>Life expectancy at birth (years)</th>
<th>Cumulative rate (%)</th>
<th>Life expectancy at birth (years)</th>
<th>Cumulative rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India†</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>1961–71</td>
<td>46.4</td>
<td>1.51</td>
<td>44.7</td>
<td>1.99</td>
</tr>
<tr>
<td>1971–75</td>
<td>50.7</td>
<td>2.56</td>
<td>49.3</td>
<td>2.92</td>
</tr>
<tr>
<td>1980s</td>
<td>54.1</td>
<td>3.15</td>
<td>54.7</td>
<td>4.88</td>
</tr>
<tr>
<td>After year 2000</td>
<td>56.6</td>
<td>5.64</td>
<td>80</td>
<td>8.80</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1976–78</td>
<td>70</td>
<td>22.50</td>
<td>76.2</td>
</tr>
</tbody>
</table>

*Based on data from the Bombay Cancer Registry for 1964–66 (5) and 1973–75 (6) and from the Oxford Registry for 1974–77 (8)

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1 in 34, respectively, and by the year 2000 it is expected that 1 in 18 males and 1 in 15 females will have cancer (assuming that there will be no major change in the currently observed incidence rates).

Cumulative rates estimated over average life span are also useful in a comparative study of intercountry differentials in the priority to be assigned to cancer. For instance, the cumulative rates estimated over average life span in the 1970s for Oxford, England (70 years for males and 76 years for females (7)) was 22.5% for males and 25.2% in females; thus, both men and women with average life expectancy had a 1 in 4 chance of being affected with cancer. In the 1970s, therefore, there was in the United Kingdom a nearly 10-fold higher risk of cancer (in those with average life span) compared with India. This indicates the relative importance of the cancer problem in the two countries.

Financial outlay for cancer

If the proportion earmarked for cancer in the total planned expenditure for health care in a given period could have been matched with the average cancer risk for the population in the country, then for the period of the 1980s an appropriate allocation would have been around 4% (3.1% in males and 4.9% in females) of the total. In fact, in 1981–82 the government of India allocated only 0.73% (Rs 28.5 million or US$ 1.8 million) of the total health sector outlay for that year for the establishment and maintenance of existing Regional Cancer Centres and early detection centres (9). Thus the actual funding is hardly in keeping with the real risks of cancer.

The financial allocation per case cancer can be estimated by assuming the crude cancer incidence in the country to be around 70 per 100,000, which gives about half a million new cancer cases per year. Although prevalence is usually considered to be 3 times the incidence, in rural India where treatment facilities are limited, the prevalence of cancers at all sites was reported to be about 1.5 times the incidence (10). We can therefore assume that the prevalence for the whole country is double the incidence or around 1 million because about 76% of the population reside in the rural areas. The current budgetary provision for cancer of Rs 200 million (US$ 12.5 million) in the seventh five-year plan, i.e., Rs 40 million annually, works out to Rs 40 (US$ 2.50) per cancer case per year, which is far from adequate.

Admittedly, the financial outlay for cancer control in the country has to be viewed in the broader perspective of other health priorities like family planning. Even so, the anticipated increases in cancer risk for both men and women till the year 2000, as shown above, should convince health planners of the need to give higher priority to cancer control in their allocation of funds.

In conclusion, while the cumulative cancer incidence rates estimated over average life span may not be an important index for the developed countries where the life expectancy is already ≥ 70 years, it is useful for determining the priorities for cancer control within the health care delivery system in developing countries.

Résumé

Indice pour évaluer la priorité à accorder à la lutte contre le cancer dans les pays en développement

Grâce aux progrès réalisés dans la lutte contre les maladies transmissibles dans les pays en développement, l'espérance de vie à la naissance a augmenté et la population est maintenant exposée à un risque de cancer proportionnellement plus élevé. Cette brève communication montre que le taux cumulatif d'incidence du cancer estimé sur une durée équivalente à la durée moyenne d'une vie humaine est un indice utile pour les planificateurs des services de santé qui doivent déterminer la priorité à accorder au financement de la lutte contre le cancer.

References