

A discussion on the screening of gynaecological cancers in Hong Kong*

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Summary

The possibility of successful screening for different gynaecological cancers is discussed against Wilson's principles for screening. Regular cervical smears satisfy the criteria for screening and can reduce deaths. The reasons for failure of cervical cancer screening in Hong Kong are highlighted. There is no evidence that screening for other gynaecological cancer is effective. The low prevalence of the other gynaecological cancers limit the cost-effectiveness of screening even if a very sensitive and specific test is available.

摘要

本文根據衛奕信的普查原則 (Wilson's principles for screening) 討論婦科癌病普查成功的可能性。子宮頸癌普查具備了所有成功條件，而且有證據支持它確能降低死亡率，然而在香港卻未獲得成功，作者探討了其失敗的原因。其他婦科癌病尚未能證實普查有效，而且，大多數發病率較低，既是有準確的普查方法，也不符合經濟效益的原則。

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Introduction

Gynaecological cancers, excluding breast cancer, killed 348 women in Hong Kong in 1995. They made up a total of 14% of all cancers and 7% of all cancer deaths for women in Hong Kong. The commonest gynaecological cancer was cervical carcinoma, which is

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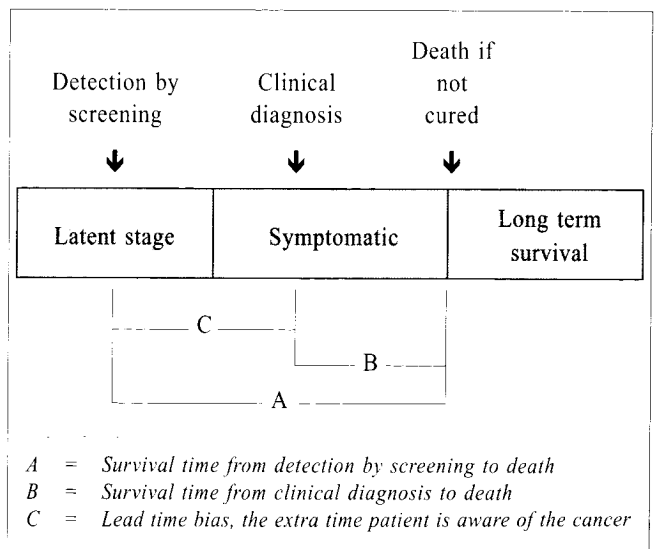
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the fourth commonest cause of cancer and 8th cause of cancer death for women.¹ The cumulative life-time risk of cervical cancer was 1 in 72. The second most common gynaecological cancer was ovarian cancer with a life-time risk of 1 in 124.

The cause of most cancers is unknown although risk factors have been identified for some of them. This means primary prevention is not possible and the hope for improving the outcome of gynaecological cancers lies with early detection and effective treatment. The availability of a test that can just detect an asymptomatic lesion is not an adequate, although essential, requirement for screening. The ultimate goal of cancer screening is to reduce mortality and not just discovering a disease earlier. Improvement in the median survival time is not equivalent to improved long-term survival because of lead-time bias as illustrated in **Figure 1**.

In the present era of evidence-based medicine, the effectiveness of a screening test should be supported by good evidence from clinical trials, which are preferably

Figure 1: Lead-time bias in cancer survival



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randomised and controlled. However, evidence on the effectiveness is not the only consideration for the success and worth of a screening test. The other principles for the screening proposed by Wilson and Jungner should also be observed²:-

1. The condition to be screened for must be important, and it should be reasonably common.
2. There should be treatment for patients with recognised disease. There is no use and it is probably unethical to screen for something whose outcome cannot be altered.
3. Facilities for diagnosis and treatment should be available. It is not ethical to detect something without the appropriate follow up action.
4. There should be a recognisable latent or early symptomatic stage when detection and treatment of the disease would make a difference to the outcome.
5. There should be a suitable screening test. The positive predictive value of the test is not only dependent on the sensitivity and specificity but also the prevalence of the disease.
6. The test should be acceptable to the population with little harm or side effect.
7. The natural history of the condition, including development from latent to overt disease, should be adequately understood, so that we could determine the frequency of screening and the appropriate follow up action.
8. There should be an agreed policy on whom to treat as patients.
9. The cost of case-finding should be economically balanced in relation to the possible expenditure on medical care as a whole. This is relative to other screening programmes and health care services.
10. Case-finding should be a continuing process and not a 'once and for all' project.

Any screening programme should be evaluated against these ten principles before its implementation. A good screening programme should satisfy all ten principles.

Cervical cancer screening

Screening for cervical carcinoma by regular Papanicolaou smears is the most successful cancer

prevention programme that has ever been developed.^{3,4} Cervical cancer screening satisfies all ten Wilson and Jungner's criteria. Although its effectiveness has never been tested by randomised controlled trials, epidemiological data from Western countries suggest that it has led to significant reductions in the incidence and mortality of cervical carcinoma.^{3,4} The annual cervical cancer mortality rate fell by 66% in women aged 50-59 years old from 1963 to 1982 in Iceland after the introduction of a screening programme that covered 80% of the women, but the fall was only 26% during the same period in Denmark where the coverage rate was 35%.⁴ The annual cervical cancer mortality rate in the UK declined very little before 1988 when the coverage of screening of the target population was around 42% but a rapid decrease was observed from 1988 to 1997 when the coverage rate increased to 85%.^{5,6} These observations suggest that the coverage rate is an important determinant of the success of a cervical screening programme for a given population.

The annual mortality rate of cervical cancer has decreased very little in the last two decades in Hong Kong while it has fallen significantly in many countries in Europe and North America.^{3,4,7} The mortality in 1980 was 5.8/100,000,⁷ which should theoretically be reduced to 2.9/100,000, based on a conservative estimation of a mortality reduction of 50% by screening, if there were 100% coverage. If the coverage rate of screening is 30%, cervical cancer death rate would be reduced to 4.9/100,000. The latter estimation is very similar to the annual cervical cancer mortality rates (4.3-5.2/100,000) observed in Hong Kong from 1993-1996.^{1,7} Surveys in Hong Kong found that only 17% to 33% of eligible women said that they had ever had a Papanicolaou smear done.^{8,9} The low coverage rate of our cervical cancer screening explained why we failed to observe a significant fall in cervical cancer mortality in our population, even though the screening test has been available for nearly three decades. Experience from studies on mammogram screening showed that the minimal coverage rate should be 70% in order to demonstrate a significant change in cancer mortality.¹⁰

Opportunistic screening by primary care doctors is the most effective way of delivering screening to all at-risk persons on an ongoing basis,² but the episodic fee-for-service health care system in Hong Kong gives little incentive for preventive care. The deliberate division

Key messages

1. Gynaecological cancers killed 348 women and made up 14% of all cancers of women in Hong Kong in 1995.
2. The main aim of cancer screening is to prevent death; an increase in median survival of cancers detected by screening could be the result of lead-time bias.
3. A cancer screening programme should not only have evidence on its effectiveness but also satisfy Wilson's principles on screening.
4. Cervical cancer screening is currently the only screening test that has been shown to be successful because it satisfies all Wilson's principles on screening. The low prevalence of other gynaecological cancers limits the effectiveness of their screening programmes.
5. The low coverage rate of cervical cancer screening could explain the lack or improvement in cervical cancer mortality in Hong Kong in the last two decades.

between preventive and curative care, the fragmented approach to preventive care and a lack of communication between the public and private health services are additional barriers preventing cervical cancer screening from reaching a large proportion of women who are at risk.

Screening for other gynaecological cancers

Ovarian cancer is the second most common gynaecological cancer and patients usually present at a late stage. Unfortunately, results from clinical trials with CA 125 and intravaginal ultrasonography screening have been disappointing.^{11,12} The development of ovarian cancers in the interval between screenings present an additional problem to screening programmes for this cancer that has a relatively short latent period (Wilson's 4th and 7th principles of screening).^{11,12}

Screening for other gynaecological cancers may do more harm than good because they are relatively rare (Wilson's first principle). For example, the average annual incidence rate of uterine cancer in women aged 50 to 69 years in 1996 was of 30/100,000.¹ If we use this as the estimate of the prevalence rate and apply a

hypothetical screening test with a 95% sensitivity and 95% specificity to women of this age group, the screening will give a positive predictive value of only 0.6% but a false positive rate of 5%. The number of women needed to be screened to detect one uterine cancer is 3448. For every cancer detected, 3448 women will have to be screened and 172 (3448 × 5%) of them will have to suffer the anxiety and undergo further tests resulting from a false positive test.

Conclusions

The ultimate goal of cancer screening is to prevent cancer death, which should be the primary outcome measure of the effectiveness for any procedure or programme. The effectiveness of a cancer screening programme must be balanced against not only the cost of screening but also the cost, harm and stress resulting from the false positive results.

Cervical cancer is the only gynaecological cancer for which screening has been proven to be effective in reducing mortality for a population. The women in Hong Kong should not be deprived of the benefit of cervical cancer screening. It is time for the Government and the medical profession to develop a policy on how cervical cancer screening should be delivered to our population. Strategies need to be developed to make cervical cancer screening accessible and affordable for all women at risk, including the elderly. A central registration is useful for the monitoring of the screening coverage and identifying those at risk.

Resources for other gynaecological cancers are better directed towards improvement of treatment effectiveness than screening. ■

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