Cancer Prevention in Primary Care

Screening for ovarian, prostatic, and testicular cancers

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This is the eighth in a series of articles on looking at how cancer can be prevented in general practice.

Box 1—Criteria for screening*

- Is the condition an important health problem?
- Is there a recognisable early stage?
- Is treatment at an early stage more beneficial than at a later stage?
- Is there a suitable test?
- Is the test acceptable to the population?
- Are there adequate facilities for diagnosis and treatment?
- What are the costs and benefits?
- Which subgroups should be screened?
- How often should screening take place?

*Modified from Wilson and Jungner¹

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Screening for cancer should not be offered routinely to a symptomatic people on a population basis unless it has been shown to be effective in reducing mortality in randomised controlled trials. A suitable screening test should have high sensitivity and specificity and a high positive predictive value. There is an ethical imperative to ensure that the benefit to each person from screening is likely to outweigh the possible harm. Preliminary studies have identified suitable screening tests for ovarian cancer, and a randomised controlled trial is about to start. There is considerable controversy about whether to screen for prostatic cancer. Likewise, there is uncertainty about the best means of treating localised prostatic cancer. Screening for prostatic cancer raises important ethical considerations which should not be ignored. Testicular self examination is of unproved benefit. Although there is a need for education about the early signs and symptoms of testicular cancer to reduce delay at presentation, a case cannot be made for screening.

Screening: general considerations

Before a screening programme is introduced several criteria need to be satisfied and the benefits and disadvantages of screening need to be assessed, as discussed in the first article (28 May, p 1418) (boxes 1 and 2). Screening should not be contemplated unless it has been shown to be effective in reducing mortality and to be worth the costs to individual people (anxiety, inconvenience, undergoing unnecessary medical procedures) and to the health service (allocation of scarce resources). Screening must also be sustainable in terms of recruitment, quality of the procedures undertaken, and follow up. Box 3 shows the factors influencing the effectiveness of a cancer screening programme, and table I shows the requirements for the performance of screening tests. In this and the next article, on colorectal cancer, I consider screening for cancers for which the criteria for screening have not yet been fulfilled and at least in some cases the potential

TABLE I—Performance of screening tests

Test		Disease	
		Present	Absent
}	Positive	True positive (a)	False positive (b)
	Negative	False negative (c)	True negative (d)

Sensitivity= $a/a+c$, the ability of a screening test to detect a disease—that is, give few false negative results.

Specificity= $d/b+d$, the ability of a test to exclude people who do not have the disease—that is, give few false positive results.

Positive predictive value= $a/a+b$, the proportion of positive test results that are truly positive. The positive predictive value reflects not only the sensitivity and specificity of a test but the prevalence of the disease in the population which is screened.

Box 2—Benefits and disadvantages of screening

Benefits

- Improved prognosis for some cases detected by screening
- Less radical treatment for some early cases
- Reassurance for those with negative test results

Disadvantages

- Longer morbidity in cases whose prognosis is unaltered
- Overtreatment of questionable abnormalities
- False reassurance for those with false negative results
- Anxiety and sometimes morbidity for those with false positive results
- Unnecessary medical intervention in those with false positive results
- Hazard of screening test
- Resource costs: diversion of scarce resources to screening programme

benefit of screening might be outweighed by the risk of harm and the costs incurred.

Screening for ovarian cancer

OVARIAN CANCER: CURRENT FACTS

Ovarian cancer is the fifth commonest cancer in women, with 5830 new cases occurring in the United Kingdom in 1988. Most (90%) cases occur in women over 45. The overall prognosis is poor. In 1992, 4360 women died of ovarian cancer in the United Kingdom. It accounts for nearly 6% of all deaths from cancer in women and is the cause of more deaths in women than for all other gynaecological malignancies combined.

Because of the lack of early symptoms, 65-75% of cases present at an advanced stage of disease. The overall five year relative survival rate is 28%, but the five year survival rate for stages III and IV combined is only 10%. A five year survival rate greater than 90% may be achieved for the small minority of women with disease confined to the ovary at diagnosis. The quality of initial surgery is an important prognostic factor and, recently, significant differences in survival have been reported between teaching and non-teaching hospitals.

PROSPECTS FOR SCREENING

The correlation between five year survival rates and

Box 3—Factors influencing the effectiveness of a cancer screening programme

- Participation of the target population
- Sensitivity of the screening test—that is, not too many false negative results
- Specificity of the screening test—that is, not too many false positive results
- Frequency of routine screening
- Adequacy of follow up of those with abnormal results
- Effectiveness of treatment of those with cancer

stage at diagnosis has long suggested that early detection may improve prognosis. No randomised controlled studies of screening for ovarian cancer have yet been conducted (although one has just begun), so there is as yet no evidence that early detection by screening reduces mortality from ovarian cancer. Box 4 shows some of the problems with screening for ovarian cancer. These underline the importance of conducting randomised trials of such screening.

SCREENING TESTS

During the past 10 years large prospective studies have provided information about the use of the antigen marker serum CA 125, abdominal ultrasonography, transvaginal ultrasonography, and bimanual pelvic examinations in screening for ovarian cancer. These studies have been uncontrolled and based on relatively small self selected populations. Additional techniques, including other serum antigen markers, intraovarian colour Doppler flow mapping, and radioimmuno-scintigraphy are being evaluated for their ability to distinguish between early malignant and benign masses.

REQUIREMENTS FOR SCREENING TEST

The overall incidence of ovarian cancer in the general female population is low. This places limitations on the performance of prospective screening tests (table I). In the United Kingdom, where the incidence for all ages is 1 in 5000, the use of a test with 100% sensitivity and 99% specificity for ovarian cancer in the general female population would result in one case of cancer being diagnosed for 5000 women screened; 50 women would have a false positive result. As the likely consequence of an abnormal result on screening is surgery, the positive predictive value of an abnormal test must be high for the screening procedure to be acceptable. A positive predictive value of 10% would result in 10 operations for each case of ovarian cancer detected. Since even a small fall in specificity would produce a large decrease in the positive predictive value, high specificity is an essential requirement for any screening test for ovarian cancer. The positive predictive value can be improved by targeting screening tests at women at high risk—for example, those aged 45 and over. However, with an incidence in this age group

of about 1 on 2500, a test with 100% sensitivity would require 99.6% specificity in order to have a positive predictive value of 10%. Ensuring a false positive rate of less than 1% is thus critical as women with positive results on screening will require laparotomy. The increased incidence of ovarian cancer among women with a family history of ovarian cancer reduces the level of specificity required to achieve an acceptable positive predictive value in this group. For the very few women with identified hereditary ovarian cancer syndromes, an even lower specificity would be acceptable.

SPECIFICITY AND SENSITIVITY OF SCREENING TESTS

The specificity of CA 125 or abdominal ultrasonography alone among postmenopausal women is about 97% and would result in more than 50 false positive results for each case of ovarian cancer detected in this population. Present evidence suggests that screening with CA 125 has a low sensitivity and may not be able to pick up cancer at a sufficiently early stage to improve prognosis. The sensitivity of serum CA 125 for identifying preclinical ovarian cancer is probably no greater than the 50% documented for clinically diagnosed stage I disease. Preliminary estimates suggest that the sensitivity of abdominal ultrasonography may be greater than that of CA 125, but the data are based on a small number of cases and incomplete follow up.

Box 4—Problems in screening for ovarian cancer

- Lack of evidence that early detection reduces mortality
- Lack of understanding how ovarian cancer develops
- No single test has both high enough sensitivity and high enough specificity to screen for early ovarian cancer, but combining tests looks promising
- Lack of evidence of the balance of the benefit of screening to possible harm
- Lack of conclusive evidence of the acceptability of the current tests to the general population
- Inability at present to determine a high risk population suitable for screening

Transvaginal ultrasonography can achieve greater specificity and sensitivity than abdominal scanning. It is also more comfortable because the bladder does not have to be full to get a good image. Specificity can be further improved by the use of colour Doppler flow techniques as a secondary screening test. This helps to distinguish between benign and malignant ovarian masses, thus reducing the number of women who require surgical investigation having had a positive result on ultrasound screening.

The only strategy that has been shown prospectively to achieve a satisfactory positive predictive value on screening in the general population of postmenopausal women is the sequential combination of CA 125 with abdominal ultrasonography (positive predictive value 26.8%, specificity 99.9%; table II). The lack of sensitivity of CA 125 in detecting early stage disease is, however, a problem. Recent data suggest that the use of multiple markers in combination might improve sensitivity without a prohibitive decrease in specificity. Another study has shown that transvaginal ultrasonography, with colour flow imaging as a secondary screening test, can effectively detect early ovarian cancer in women with a family history of ovarian cancer. The low false positive rate achieved in this study (from 3.5% after ultrasonography alone to 0.9% after colour Doppler flow imaging) has been confirmed in a pilot study of screening in the general population (table II).

TABLE II—Screening parameters in published studies of asymptomatic women

	Ultrasonography followed by colour Doppler imaging		Tumour marker CA 125 followed by ultrasonography	
	Women with family history ¹	General population ¹	Women with family history ²	General population ²
Detection rate (sensitivity)* (%)	100 (6/6)		63 (5/8)	58 (11/19)
False positive rate (%)	0.9 (15/1592)	0.5 (15/2928)	1.1 (16/1494)	0.14 (30/21 981)
Prevalence of ovarian cancer	1 in 270	1 in 2500**	1 in 190	1 in 2500**
Odds of being affected, given a positive result	1:2.5	1:12	1:3	1:6

*With follow up of 24 months.

**Estimate based on incidence of ovarian cancer in England and Wales among women aged 50 to 64 in 1987.

||Based on detection rate in women with family history.

Box 5—Bimanual pelvic examination as screening test for ovarian cancer

- Low specificity
- Cannot distinguish between benign and malignant ovarian cysts
- No convincing evidence that benign cysts have malignant potential
- High false positive rate because of benign disease
- Low sensitivity
- Should not be used as a routine screening procedure in asymptomatic women

BIMANUAL PELVIC EXAMINATION

Bimanual pelvic examination warrants special mention because it is currently performed routinely in many general practices on asymptomatic women who attend for cervical screening. Bimanual pelvic examination has a low specificity (97.3%) and sensitivity and, when used alone, is not acceptable as a screening test for ovarian cancer (box 5). Unpublished evidence suggests that the false positive rate is high when examinations are performed by a gynaecologist, but it is even higher when performed by general practitioners and practice nurses (I Jacobs, personal communication). The false positive rate is particularly high in premenopausal women. The precise sensitivity of pelvic examination is not known but seems to be very low. Moreover, pelvic examination does not seem to be effective in detecting early stage disease. In two ultrasound studies in Sweden four of the 10 ovarian cancers detected by ultrasonography could not be detected by pelvic examination, and in a further study none of the four tumours detected by ultrasonography could be found by pelvic examination. In a study at King's College Hospital, London, only one of the five primary ovarian cancers could be detected by manual examination after ultrasonography. The available evidence strongly suggests that bimanual pelvic examinations should not be performed as a routine screening procedure in asymptomatic women.

FIG 1—Deaths from cancer of the prostate (n=9629) in Britain, 1992*

SCREENING WOMEN WITH A FAMILY HISTORY

In the absence of a documented reduction in mortality in a randomised controlled study, recommendations about screening for ovarian cancer in women at high risk must be seen as contentious. Current opinion among many experts is that screening women with only one affected relative should be restricted to research protocols, but, for the few women from families with the hereditary ovarian cancer syndrome the risk is sufficiently high to warrant annual ultrasound screening from the age of 25 or five years before the age at which cancer was detected in the youngest affected member of the family. Because of the doubts about the efficacy of screening, prophylactic oophorectomy should be considered in the highest risk families once childbearing is completed. However, even bilateral oophorectomy does not guarantee complete protection against the development of cancer.

CONCLUSION

Currently two screening procedures show promise: a combination of prescreening with serum CA 125 and selective ultrasound examination (preferably using vaginal probes with colour Doppler facility) and screening by transvaginal ultrasonography with colour Doppler as a follow up investigation. A multicentre randomised trial of the latter procedure has just begun in six centres in different European countries, including the United Kingdom.

Ultimately, both specificity and sensitivity may be improved by using a panel of complementary tumour markers as an initial screening test and transvaginal

ultrasonography with colour Doppler imaging as secondary tests. Recent advances in molecular genetics have raised the possibility that a high risk population suitable for screening may be defined by genetic markers.

Until screening has been shown to reduce mortality from ovarian cancer in large randomised population based trials and until the balance of potential benefit to costs, both to women and the health service, has been assessed, screening for ovarian cancer should not be offered routinely to asymptomatic women.

Screening for prostatic cancer

PROSTATE CANCER: CURRENT FACTS

Prostatic cancer is the second most common cancer in men in the United Kingdom (excluding non-melanoma skin cancer), with 13 970 new cases in 1988. The incidence has been increasing. Some but not all of this increase is due to improved diagnosis and increased life expectancy. A genuine increase in incidence may be related to changing diet, lifestyle, and environmental factors. There were 9629 deaths from prostatic cancer in 1992 (11% of all deaths from cancer in men). More than 95% of all new cases and more than 97% of all deaths from prostatic cancer occur in men aged 60 and over (median age 75 to 79 years for both incidence and mortality) (fig 1). Thus the main impact of the disease is on a population with a relatively limited life expectancy. Numerous studies have shown that about 30% of men over 50 had evidence of latent prostatic cancer at necropsy, but only 1% of these had clinically important disease and the rest died from other causes.

The five year survival rate for prostate cancer is 43%, reflecting the late stage at diagnosis in most cases. Currently about 60% of men present with metastatic disease.

PROSPECTS FOR SCREENING

The fact that prostate cancer is an important cause of morbidity and mortality and that most cases present with metastatic disease make screening an attractive proposition. There is, however, much debate and controversy about screening for prostatic cancer. Box 6 shows some of the problems.

SCREENING TESTS

The screening tests in current use are digital rectal

Box 6—Problems in screening for prostatic cancer

- Relatively unimportant cause of premature mortality—that is, few potential years of life saved
- No clear evidence that screening and treatment will reduce mortality from the disease
- Enormous scope for overdiagnosis (detection of clinically insignificant disease)
- Absence of an acceptable and valid test to determine accurately which cancers will remain latent and which will progress
- Low specificity, sensitivity, and positive predictive value of existing tests
- Uncertainty about the appropriate treatment for early disease
- Side effects of treatment for cancer detected on screening
- Psychological consequences to those found to have preclinical disease: in most cases the disease would never have progressed
- Financial costs of screening
- The ethics of screening for the disease—more harm may be caused than benefit

examination, prostate specific antigen, and transrectal ultrasonography. No screening test has been shown to reduce mortality from prostatic cancer. Most studies on the validity of these tests have been in symptomatic men.

Digital rectal examination has a limited sensitivity in detecting organ confined and potentially curable disease (30-40% of cancers detected). As a result, studies based in general practice have questioned its value as a routine screening measure when it is done by general practitioners.

Transrectal ultrasonography also has its limitations. When used alone it has a low sensitivity, although it may be more sensitive than digital rectal examination. It can, however, provide fairly reliable information about the nature of the lesion. Some studies have shown that the detection rate with transrectal ultrasonography was nearly twice that with digital examination. Moreover, it detected a higher percentage of cases of localised disease. But, although ultrasonography seems to be more sensitive than digital examination, some lesions can be detected by palpation and not by ultrasonography.

Prostate specific antigen is becoming an increasingly important serum marker for prostatic cancer. Its use has contributed to the detection of an increased proportion of cases of clinically and pathologically confined prostatic cancers but at the expense of large numbers of false positive results. It is not known whether this earlier detection will result in a reduction in mortality. Although prostate specific antigen has a higher sensitivity than digital rectal examination, it is not sufficiently sensitive to be used alone as a diagnostic test for prostatic cancer. Normal values (< 4 ng/ml) are found in about 25% of men with localised prostatic cancer. Some 10-15% of men over 50 have serum values over 4 ng/ml, and cancers are diagnosed in 25-30% of them. Raised concentrations also occur in patients with benign prostatic hyperplasia, prostatitis, and prostatic manipulation, as well as prostatic cancer. Over 25% of men with benign prostatic hyperplasia may have raised concentrations of prostate specific antigen (usually in the range of 4 to 10 ng/ml, but a substantial number of such men will have serum concentrations up to 15 ng/ml). Both the sensitivity and specificity of prostate specific antigen are hampered by the complex natural history of prostatic cancer. A lower cut off level—that is, less than 4 ng/ml—would improve sensitivity but reduce specificity, while a higher cut off level would improve specificity but reduce sensitivity. Further work is necessary to establish the sensitivity, specificity, and positive predictive value of different cut off levels of prostate specific antigen concentration in asymptomatic men in order to enhance its ability to distinguish benign prostatic hyperplasia from prostatic cancer and to be able to distinguish clinically significant, impalpable prostatic cancer reliably.

The most cost effective approach to early detection seems to be the combination of digital rectal examination and prostate specific antigen as primary screening tests, with transrectal ultrasonography reserved as a diagnostic tool for those who have abnormal findings in one or both of the other tests. Transrectal ultrasonography is also useful in obtaining ultrasound guided biopsy specimens. Even with this combined approach, however, the detection rate of localised lesions may still be low, many cancers will be missed, false positive results will be high, and many cancers will be diagnosed that would otherwise have remained latent. As the specificity of the three tests is comparatively poor, a fairly high proportion of screened subjects with suspicious results in one or more of these tests will need to undergo a prostatic biopsy without having the disease. This is a disturbing observation.

Currently, the possible morbidity resulting from these tests (particularly if they result in a biopsy), the psychological distress of men with false positive results, the morbidity and mortality from unnecessary treatment of men diagnosed as having incurable disease, and, above all, the detection of clinically insignificant disease with its associated emotional trauma, all weigh heavily against screening. These observations underline the importance of conducting randomised controlled trials to determine whether screening for prostate cancer reduces mortality.

TREATMENT OF LOCALISED PROSTATIC CANCER

Recommendations on the treatment of localised prostatic cancer (small foci of well differentiated tumour) are at least as controversial as the question of whether to screen. Current treatment for localised disease ranges from radical prostatectomy or radiotherapy soon after diagnosis to no treatment until there is evidence of cancer progression. Hormonal manipulation (androgen deprivation) is used for metastatic disease, although there is no firm evidence that hormonal treatment prolongs life span: most patients with metastases still die of their disease.

No studies definitely support a benefit of aggressive treatment of clinically localised prostatic cancer over deferred treatment after 10 years of follow up, and radical prostatectomy and radiotherapy seem to be equally effective. Deferred treatment warrants consideration as a management option because early stage prostatic cancer may progress slowly, mortality from other causes is a significant factor, and cancer specific survival rates (at least to 10 years after diagnosis) seem to be similar to those for aggressive management. In a study in Sweden patients treated with expectant management for localised prostatic cancer had disease specific survival rates at 10 years of 86-8%. Survival was equally high in a subgroup of patients who met current indications for radical prostatectomy or radiotherapy. Less than 10% of a series of patients observed with no initial treatment died of prostatic cancer after a mean follow up of 10 years.

In the absence of properly conducted randomised controlled trials comparing the efficacy of these methods, the management of prostatic cancer tends to be based on opinions and clinical prejudices rather than facts. In the United States a survey showed that 93% of radiation oncologists but only 8% of urologists would choose radiotherapy for localised disease, whereas 79% of urologists but only 8% of radiation oncologists would choose a radical prostatectomy. In the United States there has been an increasing tendency to use radical prostatectomy in men over 70, while in some European centres and in the United Kingdom it has become more common not to treat truly focal disease if it can be diagnosed with reasonable certainty in older men. Men under 60 who may outlive the progression of their tumour might be considered candidates for an aggressive approach.

Both surgical and radiation techniques have improved considerably, thereby reducing morbidity from the treatment. However, morbidity, particularly from surgery, is still not negligible. Of those undergoing nerve sparing radical prostatectomy, roughly 50% are rendered impotent, even after a year; up to a quarter experience mild to disabling incontinence; 3% may suffer a rectal injury; and 1% require a colostomy. In addition operative mortality is 1-2%. Radiotherapy has a lower risk of death (0.07-0.5%) and complications, but it may not completely eradicate the disease. Although salvage prostatectomy can be performed after radiotherapy, the complication rate is significantly higher than that after immediate radical prostatectomy.

The use of aggressive treatment in men over 70 is

debatable as these patients are unlikely to die of their prostatic cancer. The available data raise important questions about whether treatment improves long term outcome. Currently, at least two studies in Europe are comparing deferred treatment with radical prostatectomy or radiation therapy, or both.

CONCLUSION

No screening test or combination of tests has been shown to reduce mortality from prostatic cancer. The overwhelming majority of prostatic cancers remain latent. It has been estimated that screening would result in a 2.5% detection rate, which is 215 times the current incidence in England and Wales. This suggests a large element of overdiagnosis of slowly progressive or non-progressive disease. The natural history of localised prostatic cancer is still insufficiently understood. Until it is possible to distinguish between early cancers that will progress and therefore need treatment and those that will remain latent, screening will result in many elderly men being treated for a disease that is not life threatening. In view of the lack of randomised treatment studies comparing radiotherapy or radical prostatectomy with deferred treatment for localised disease, and the reported side effects of the available methods of treatment, the adverse consequences of screening might well outweigh its potential benefits. The ethical imperative is to ensure that the benefit to each patient from screening is likely to outweigh the harm. Prostatic cancer screening therefore raises important ethical considerations which should not be ignored.

Even if all these problems can be resolved, it will still be necessary to establish the effectiveness of screening in reducing mortality from prostatic cancer by means of well designed randomised controlled trials before routine screening can be recommended for asymptomatic men on a population basis. One such trial is currently under way in the United States and another is planned in Europe, but it will be 10 years or more before they give an answer.

Screening for testicular cancer

TESTICULAR CANCER: CURRENT FACTS

Testicular cancer is the commonest cancer in men aged 20-34 in the United Kingdom. Overall, 1250 new cases were registered in England and Wales in 1988, over half of which occurred in men under 35 (85% in men under 50).

Most testicular cancers (95%) are germ cell tumours (40% of these are seminomas, 60% teratomas). Between 50% and 60% of cases of seminoma and 30% of cases of teratoma present at the early stage of disease.

Testicular cancer is highly susceptible to modern methods of treatment. Survival for early stage disease is high (95-100%). Important advances in treatment, particularly combination chemotherapy, have proved highly successful for all patients with metastatic disease, about 90% of whom can be cured. Survival for metastatic teratoma has increased from less than 20% in the early 1970s to at least 90% at present. However, the cure rate is lower for patients with teratoma who have large volume metastatic disease (about 60%).

The success of modern treatment is reflected in falling death rates in young men (fig 2). The number of deaths from testicular cancer in England and Wales has decreased by over half, from 267 in 1972 to 123 in 1992. Analysis of incidence rates over the course of the century, however, shows that incidence is increasing in young men. The reasons for this are not clear. The increase in incidence in young men is not in itself a justification for screening. Screening does not provide a solution to the incidence of cancer but to mortality. The low number of deaths from testicular cancer each

year means that the scope for screening to have an effect is small.

CRYPTORCHIDISM

The only established and significant risk factor for testicular cancer is cryptorchidism (undescended testis). Unilateral undescended testis carries a threefold to fourfold increased risk of developing testicular cancer. For men with unilateral undescended testes the risk is increased two to three times in the contralateral testis, suggesting that some underlying testicular or hormonal effect may predispose both to maldescent and to tumour development. A recent study has shown that men who had unilateral undescended testes that were successfully corrected by orchidopexy before the age of 10 years were no longer at increased risk of developing testicular cancer. Orchidopexy at particularly young ages (under 5 years) was not necessary to remove the increased risk. Thus general practitioners should be recommending orchidopexy in boys aged 5 to 10 with unilateral undescended testes.

Bilateral undescended testes carry a tenfold increased risk of testicular cancer. Orchidopexy does not alter this substantially increased risk.

DELAY IN DIAGNOSIS

Early diagnosis of testicular cancer is likely to be associated with simpler and less toxic treatment. If screening was to have any benefit its main impact would most likely be in reducing the number of men requiring toxic chemotherapy rather than in reducing mortality.

There is much evidence suggesting a significant association between delay in presentation and clinical stage at diagnosis. Delay is more important for the outcome for teratomas than for seminomas. More than 90% of men with testicular germ cell tumours present with a swelling of the testis. It is rare for them not to be aware of the testicular abnormality, and delay in diagnosis is not usually due to this cause. Rather, delay reflects reluctance of the patient to consult his general practitioner, sometimes out of fear or embarrassment but often because of lack of awareness that a potentially serious and progressive illness may arise in the testis.

Delay in referral from general practice to hospital also occurs. This can be avoided by an understanding of the differential diagnosis of testicular tumours and epididymo-orchitis, and by maintaining a high level of suspicion for men with testicular complaints, in whom testicular abnormalities should be reassessed even if they are thought to be benign initially.

NEED FOR EDUCATION ABOUT TESTICULAR CANCER

The correlation between delay and the stage of the disease at diagnosis, particularly for teratomas, has led to suggestions of the importance of educating patients and general practitioners about testicular

FIG 2—Death rates from testicular cancer per million population in England and Wales, 1971-5 and 1981-5*

Box 7—Problems with testicular self examination

- Testicular cancer is rare, with a low number of deaths each year
- General practitioners may see only one or two cases of testicular cancer in their professional careers
- There is no evidence that self examination reduces the already low mortality from testicular cancer
- There is no evidence that practising self examination influences delay at diagnosis
- The cost of self examination per cancer detected could be very high
- The number of false positive results, with their associated anxiety, would be high
- Few men would stand to benefit, so possible harm is likely to outweigh potential benefits

cancer and the need to encourage testicular self examination, particularly in young men. The available evidence suggests low levels of awareness of testicular cancer and its symptoms, and very few men report that they examine their testes. There is no method by which a man can reduce his risk of developing testicular cancer, but knowledge of its early signs and symptoms (including the raised risk in men with a history of cryptorchidism) should be included in general health education to reduce any delay in seeking medical advice. The commonest symptoms include a change in the size or the texture of the testicle and a feeling of heaviness in the scrotum.

EFFICACY OF TESTICULAR SELF EXAMINATION

Although screening by routine testicular self examination has been proposed, no randomised studies have been conducted to assess its benefit; mounting a trial is unlikely, given the rarity of the disease, the low number of deaths each year, and the exorbitant cost of conducting such a trial. Box 7 shows the problems associated with testicular self examination. No studies have shown that men who examine their testes are more likely to detect early stage tumours or improve their prospects for survival than those who do not practice self examination. There is also no evidence that practising testicular self examination leads to a reduction in delay at presentation. There are no firm data on the specificity of self examination, but, from anecdotal reports, its widespread application might lead to a substantial increase in investigation of non-malignant conditions with its associated anxiety. There are few studies on whether teaching testicular self examination motivates men to perform it or to perform it correctly. Research to date has shown only that education about testicular cancer and self examination may enhance knowledge and self reported claims of performing self examination.

CONCLUSION

Although there is a need for education about the early signs and symptoms of testicular cancer to reduce delay in presentation, a case cannot be made for screening. Testicular cancer does not meet the first criterion for screening (box 1). The prevention of about 120 deaths per year does not constitute a major public health problem. The fact that testicular self examination is of unproved benefit means that its teaching to the general male population, or even to younger men at higher risk, is unwarranted. The lack of evidence of its efficacy means that even the advisability of a screening programme targeted at men with a history of cryptorchidism is questionable.

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