

SCREENING FOR PROSTATIC CANCER

The German experience

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Abstract

The principles for screening for detection of early prostate cancer in the Federal Republic of Germany are described. Men are entitled from the beginning of their 45th year of life to an examination for early detection of cancerous diseases once annually and this examination is paid for by the insurance system. In the age group around 60 years about 15% of the men participate. Among 1 341 833 men participating in 1987, 1 638 new cases of prostate cancer were detected. The proportion of cases suitable for total prostatectomy has increased considerably since the screening program was introduced and now stands at about 25% in the author's department. The survival rate of this group is comparable to that of the general population, when adjusted for age distribution. It is suggested that screening for prostate cancer might reduce the mortality of this disease.

Key words: Prostate cancer, screening, radical prostatectomy.

Malignant tumors are potentially curable when detected at an early stage. Investigations concerning the biological behavior of different tumor types have demonstrated that cancer does not grow aimlessly, but that it shows—within a wide range—a certain regular conduct. The development of cancer is a protracted process of up to 30 years until the final phase of metastasizing occurs which leads to the death of the patient. The probability of metastasizing depends on the size of the primary neoplasm as well as on its particular tendency for producing metastases. It is an important fact that during approximately 80% of its entire life span the tumor exhibits no clinically detectable signs or symptoms. When symptoms appear, the tumor is frequently at an incurable stage. This is what makes early diagnosis of cancer so outstandingly important.

The multitude of cancer diseases obviously prohibits a general screening effort for 'the' cancer (1). Screening programs must on the one hand concentrate on the most frequent types of cancer, while on the other hand the

following prerequisites must apply: the measures utilized for screening must be practicable from a technical and financial standpoint and by expenditure of work, and they should cause only reasonable inconvenience to healthy persons. Furthermore, early detection of cancer is of advantage only when treatment of the disease results in a true gain in the patient's life span and/or in the quality of his life.

Wilson & Jungner (2) in 1968 formulated the basic criteria for employing screening examinations by establishing the following four points;

- 1) The diseases must be susceptible to efficacious treatment modalities.
- 2) The pre- and early stages of the disease must be recognizable within the scope of existing diagnostic methods.
- 3) The signs and symptoms of the diseases must be sufficiently identifiable by medical-technical means.
- 4) Physicians and medical institutions must be available in sufficient numbers in order to diagnose and treat the patients under suspicion.

In addition, the following factors should be regarded as prerequisites for screening measures (3):

- the disease should be a substantial health problem for the general public,
- it must be possible to verify the suspected diagnosis,
- the methods used for screening and for the verification of the diagnosis must have a high degree of reliability,

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- an acknowledged treatment modality for that particular disease must be available,
- the treatment in the early stage of the disease must be definitely more promising and less straining for the patient than in an advanced stage,
- the expense of the diagnostic and therapeutic procedures relating to such a program must be reasonably balanced in relation to total expenditure on the health care system.

According to these criteria, carcinoma of the prostate is a disease well suited for a screening program. In Germany as in the USA and in many European countries it is the second or third leading cause of death from cancer in men. In the Federal Republic of Germany prostate cancer strikes approximately 15 000 men and kills about 8 000 annually. Thus, cancer of the prostate accounts in FRG for about 10% of all new cancer cases and for approximately 8.5% of the deaths per year among men. When detected at an early stage, the disease is potentially curable.

Traditionally, the early detection of prostate cancer in asymptomatic men has depended on digital rectal examination, and this can be done repeatedly and at low cost without causing any harm to the patient. While the new techniques such as transrectal ultrasonography and prostate-specific antigen can help to evaluate abnormal findings, they have not proven to be effective screening tools so far, irrespective of the fact that their application would increase the costs to an unacceptable level as far as screening examinations are concerned.

In the Federal Republic of Germany a law became effective on July 1, 1971 stating that every member of one of the compulsory insurance companies of the German health care system is entitled to certain measures with regard to early detection of diseases (4). As far as the field of urology is concerned the appropriate article reads as follows: 'Men from the beginning of their 45th year of life are entitled to an examination for the early detection of cancerous diseases once annually'. In the population this screening program has become more or less popular as a 'free' examination, i.e. one without charge.

How is this screening program organized? The physician has a central check list at his disposal in order to document the findings. This list shows patient data such as name, date of birth, etc., including the patient's insurance company. It gives a brief medical history and the findings from examination of the skin, the external genitalia, the prostate, the rectum and the regional lymph nodes. In addition, the urine and the faeces are examined for hematuria and blood in stool respectively. Finally, the blood pressure is taken.

The screening program for prostate cancer concentrates on three points, namely a brief medical history, digital rectal examination, and urine analysis including microscopic examination of the sediment. If the history and/or findings of

Table

Detection of cancer in males in the FRG as a result of the screening program in 1987

Histologically diagnosed cancer	No.
Prostate	1 638
External genitalia	68
Colon	415
Rectum	548
Melanoma	212
Other malignancies of the skin	91
Participants in the screening program	1 341 833

the examination suggest the possibility of a cancer disease, further diagnostic measures are being arranged.

Physicians of various medical disciplines are participating in these screening examinations. General practitioners and internists perform the vast majority of the examinations (77.9%), followed by urologists (14.6%), surgeons (2.5%), dermatologists (1.4%) and other specialists. All urologists can be assumed to participate in the screening program (5).

Among 1 328 863 screening examinations in men performed in the FRG, 96.25% showed no significant findings. In 1.7%, suspicious observations of the prostate and the external genitalia were obtained as compared to 0.74% of the skin and the rectum and 1.31% by way of the urine analysis.

The latest available figures from the FRG are those of 1987. Out of 1 341 833 male participants in the screening program for that year, 1 638 were found to have histologically proven prostatic cancer (Table). The proportion of these patients with prostate cancer in potentially curable stage has not been submitted. It was stated, however, that 21.5% of the patients with prostate cancer were younger than 65 years and 41.6% over 75 years old. (4)

The participation rate of the male population in the screening program in 1987 showed a peak around the age of 60 years, with 15% of the men taking part in the examination, whereas the figure for the 45-year age group was only 8% (Fig. 1) (4). Fig. 2 demonstrates that over the years women have a constantly surpassed higher cancer screening participation rate than men.

What payment can the physician expect for performing a screening for cancer? This differs from one insurance company to another and also from one region of the FRG to another. In the area where I live, the largest compulsory insurance company ('Allgemeine Ortskrankenkasse Würzburg') presently pays DM 26.—per case, whereas other companies (so-called 'Ersatzkassen') pay DM 29.25 for the same examination. These sums cover the medical interview and the clinical examination of the patient. Laboratory

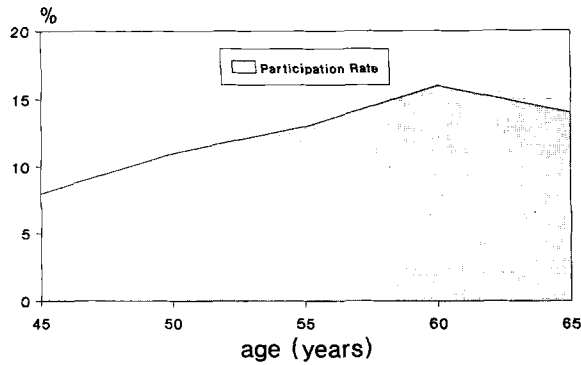


Fig. 1. Screening for cancer in the FRG in 1987. Participation rate of males.

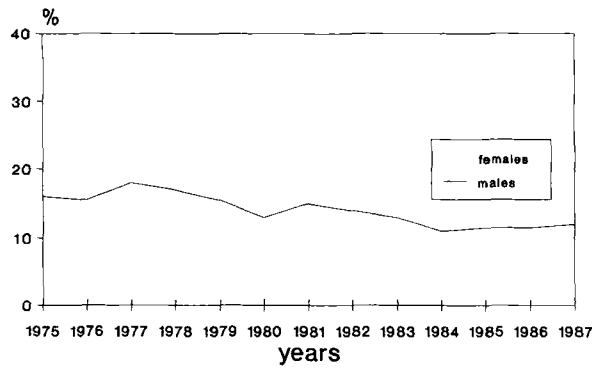


Fig. 2. Screening for cancer in the FRG 1976–1987. Participation rates of males and females.

examinations of urine and stool are separately reimbursed, even though these tests are considered part of the screening program.

According to an information obtained from the Federal Bureau of Statistics the total costs of the health care system of the Federal Republic of Germany amounted to DM 260.9·10⁹ in 1987, which is 9.6% of the GDP (gross domestic product). The expenses of the compulsory insurance companies in the same year amounted to a total of DM 122.2·10⁹, and out of this sum DM 3.8·10⁹ were reimbursed for all screening programs including those not designed for cancer detection. It appears to be the opinion of those responsible for the health care system that this is money well spent.

A statistical analysis of the data from my own department (Fig. 3) reveals that, since the screening program for prostate cancer began there has been a growing incidence of cases in the early stages suitable for radical prostatectomy. Of all patients admitted to the department with prostatic cancer during recent years 23.6% could be subjected to this potentially curative treatment. This favorable percentage can certainly be attributed to the German screening program. Figs 4 and 5 demonstrate that the 10-year survival of patients with stages A, B and C prostate cancer equals that of an age matched control group of healthy men.

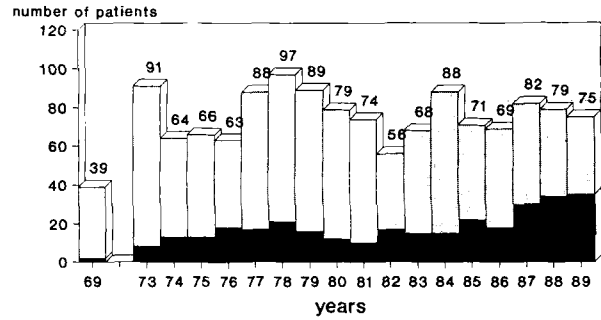


Fig. 3. Prostatic carcinoma. Department of Urology, University of Würzburg, Medical School. Number of cases per year 1969, and 1973–1989. ■ radical prostatectomy (n = 316); □ prostatic carcinoma (n = 1 338).

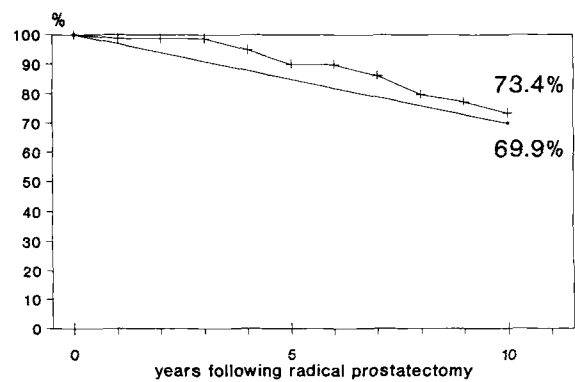


Fig. 4. Survival after radical prostatectomy, stages A and B (n = 79); University of Würzburg, Medical School. + radical prostatectomy; — age matched controls.



Fig. 5. Survival after radical prostatectomy. Stages A–C (n = 96). University of Würzburg, Medical School. + radical prostatectomy; — age matched controls.

Our experience suggests that early detection of prostatic carcinoma by screening is a feasible approach which might reduce the mortality of this type of cancer.

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