

Bladder cancer: approaches to prevention and control*

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Bladder cancer is the twelfth most common cancer globally, with approximately 170 000 new cases each year; a third of these cases are in the developing countries. There are two major etiological types. The first is more common in the industrialized countries and is associated with exposure to certain occupational and environmental carcinogens; but most importantly with tobacco smoking. The second type is associated with Schistosoma haematobium infection of the urinary tract and is one of the most frequent tumours in eastern Mediterranean and African countries. Both types of bladder cancer are largely preventable. Comprehensive education and legislative approaches are recommended to reduce tobacco consumption and exposure to industrial carcinogens. Safe and effective drugs are available to treat schistosomiasis within integrated control programmes in endemic areas.

EPIDEMIOLOGY AND ETIOLOGY

Bladder cancer is estimated to occur in about 170 000 people every year, two-thirds in the developed countries (where it is associated with tobacco smoking and various occupational and chemical-related exposures) and one-third in developing countries (where it is often associated with urinary schistosomiasis). It is the eighth most common cancer among males (130 700 cases) and the eleventh among females (39 400 cases). It is thus predominantly a tumour of males with a male/female ratio of 3:1 overall (1). Table 1 gives the estimated annual incidence worldwide by major regions. The highest rates are found in Europe, North America and Australia/New Zealand, all of them industrialized areas with a history of high tobacco consumption. High-risk areas also include parts of northern and eastern Africa, such as Egypt, and Malawi, and Iraq, where schistosomiasis is endemic.

In Europe, the age-adjusted bladder cancer incidence varies from high levels in parts of Switzerland (30.2 per 100 000 males), Italy (24.6),

France (22.0), Denmark (22.0), and the United Kingdom (19.5) to low levels in Finland (9.9), Czechoslovakia (8.4), and Yugoslavia (7.1) (2).

In Egypt (Cairo), bladder cancer is the most common cancer, comprising 28.8% of all cancers in males and 11.7% of all cancers in females. In Iraq (Baghdad), it is the second most frequent cancer in both males and females, accounting for 14.5% of all cancers in males. Among males, it accounts for 11.2% of cancers in southern Iran, and between 8.8% and 11.3% of cancers in Malawi and Zambia (3, 4).

The general trend at present is an increase in bladder cancer worldwide, which is most likely due to increased tobacco consumption over the last 20-30 years. For example, age-adjusted incidence rates increased by more than 85% in males and by more than 50% in females in Denmark, Finland, Iceland, Norway and Sweden between 1960 and 1980 (5).

Comparative characteristics of the two major etiological types of bladder cancer are summarized in Table 2.

Tobacco

Tobacco smoking is the most important cause of bladder cancer. In countries with a history of prolonged cigarette usage, approximately 50% of bladder cancer in men and 25% in women are attributable to tobacco smoking. The relationship between bladder cancer and the duration and intensity of smoking are similar to those for lung cancer, although the risks are lower. The risk for the heaviest

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Table 1. Estimated annual number of new cases and incidence rates of bladder cancer by region^a

Region	New cases		Crude incidence rates (per 100 000)	
	Males	Females	Males	Females
Northern, western and southern Europe	41 000	9900	22.9	5.2
Eastern Europe and USSR	16 200	5500	9.6	2.9
Northern Africa	7500	2800	16.0	6.0
Other parts of Africa	4400	1800	2.9	1.1
North America	25 300	9100	22.0	7.5
Middle and tropical America and the Caribbean	6800	1600	4.8	1.1
Temperate South America ^b	3000	1100	15.8	5.8
Australia and New Zealand	1400	500	17.5	5.6
Japan	2600	1100	4.7	1.9
Asia and Pacific Islands ^c	22 500	6000	2.0	0.5
Developed regions	86 500	26 100	16.4	4.6
Developing regions	44 200	13 300	2.9	0.9
World	130 700	39 400	6.4	1.9

^a Regions with similar rates have been grouped together. Adapted from reference 1.

^b Argentina and Chile.

^c Other regions than Japan, Australia and New Zealand.

cigarette smokers is about five times that for the nonsmokers. A decreased risk of bladder cancer, approaching that of a nonsmoker, is seen approximately 15 years after smoking cessation (6).

Occupation

Epidemiological studies have documented an increased risk of bladder cancer for a variety of occupations, particularly workers in the dye and

rubber industries. A recent analysis of published case-control studies concluded that between 1% and 19% of bladder cancers were attributable to occupation; the majority of the estimates of attributable risk were between 3% and 7% (7). Identified occupational carcinogens consist primarily of the aromatic amines: 4-aminobiphenyl, auramine, benzidine and 2-naphthylamine.

A recent report from the National Bladder Cancer Study in the USA indicated that males usually

Table 2. Comparative characteristics of the two major etiological types of bladder cancer^a

Characteristics	Mainly associated with tobacco and occupation	Mainly associated with schistosomiasis
Geographical epidemiology	Industrialized countries with high tobacco consumption	Schistosomiasis endemic areas
Occupational risk	Dye and rubber industries	Farming
Estimated latency after initial infection or exposure	30-40 years	20-30 years
Median age at diagnosis	65-75 years	40-50 years
Cell type	Transitional (75-95%)	Squamous (40-85%)
Number of sites	Tends to be multiple (up to 25% of bladder)	Tends to be a single mass
Metastases	Frequently	Rarely

^a Adapted from reference 4.

employed as truck drivers or delivery-men have a 50% increased risk of bladder cancer. An increased risk of 120% was associated with truck driving of 25 years' duration or more. It was estimated that approximately 4% of bladder cancer diagnosed among males in the USA may be attributable to exposure to motor exhaust incurred during employment as a truck driver (8).

Other factors

Therapeutic agents such as cyclophosphamide and chlornaphazine have also been associated with the induction of bladder cancer. However, the overall proportion of bladder cancer attributable to these factors is extremely small.

Epidemiological evidence of an association between coffee drinking, artificial sweeteners and bladder cancer is weak and doubtful. The public should not be worried about such possible associations at the present time.

Schistosomiasis

Schistosomiasis (bilharziasis) is a parasitic disease transmitted to man via water snails which proliferate in shallow canals and waterways. The life-cycle of this parasite is maintained by the insanitary habits of man. The highest prevalence of infection is observed in school-age children.

Of the three major types of schistosomiasis, it is *Schistosoma haematobium* which is clearly associated with carcinoma of the bladder. *S. haematobium* is endemic in 52 eastern Mediterranean and African countries where at least 180 million persons are at risk of infection and about 90 million persons are infected, predominantly males in agricultural occupations (9-11). The excretion of blood and protein in the urine of infected children, as well as adults, is directly correlated with the number of *S. haematobium* eggs in the urine. These clinical manifestations are related to bladder lesions which may develop into chronic disease, including carcinoma of the bladder, 20-30 years after infection begins.

Evidence linking *S. haematobium* and bladder cancer comes from three basic sources: variations in pathology, geographic epidemiology, and case-control studies.^a Almost all the reported series of bladder cancers associated with urinary schistosomiasis are generally of the squamous-cell type (see Table 2). In some areas of Africa the incidence of squamous-cell bladder cancer is 35 times higher than

that observed in the USA and United Kingdom (12). A clear positive geographical correlation between *S. haematobium* infection rates and bladder cancer was found in Africa, although there was a wide variation in the degree of correlation observed. A number of case-control studies have investigated the association between bladder cancer and a history of *S. haematobium* infection, which was determined primarily by the presence of eggs in the histological sections. In endemic areas a higher rate of *S. haematobium* infection is generally found in individuals with bladder cancer than in controls. Estimates of a relative risk of approximately 3.0 and an attributable risk of approximately 50% from studies in Africa are common. Surveys in hospital clinics in Egypt indicate that squamous-cell bladder cancers occur in 10 out of every 1000 infected adults compared with 0-3 cases in every 1000 adults without *S. haematobium* infection (13).

Although the mechanisms by which *S. haematobium* infection may predispose to cancer have not yet been established, experimental research tends to confirm this association. Observations from animal studies indicate that infection with *S. haematobium* supplies the proliferative stimulus necessary to accelerate the development of tumour foci from cells initiated or altered by exposure to low doses of bladder carcinogens. Urinary schistosomiasis might therefore be expected to increase the incidence of clinical symptomatic bladder cancer in exposed populations.

The predisposition to secondary bacterial infection of the urinary tract, which is due to pathological changes caused by chronic *S. haematobium* infection and results in the production of nitrosamines, may be a contributing etiological factor for bladder cancer. Disturbance of liver function as a result of schistosomiasis may lead to the production of abnormal tryptophan metabolites which have a carcinogenic effect. Synergism between the smoking of tobacco and schistosomiasis has also been suggested.

Compared with most other cancers, a great deal is known about the etiology of bladder cancer. However, the known factors can only account for about half of current cases. More research, especially concerning cofactors, is needed.

PRIMARY PREVENTION

Prospects for the primary prevention of bladder cancer worldwide are good because of the extent of present knowledge on etiology and the availability of national control programmes that have been shown to be effective in changing behaviour and reducing the exposure to risks.

^a PIKE, M. C. *The epidemiological association between Schistosoma haematobium infection and bladder cancer*. Unpublished document, WHO/SCHISTO/86.86 - WHO/CAN/86.1, 1986.

Tobacco

In May 1986 the Thirty-ninth World Health Assembly affirmed that cigarette smoking is a major avoidable cause of cancer in the world today and called for global public health action to combat the tobacco pandemic. While the reasons for implementing effective tobacco control programmes go far beyond the problem of bladder cancer, a reduction in bladder cancer mortality will be one of the benefits to result from such public health initiatives. It is estimated that between 50 000 and 75 000 deaths from bladder cancer could be prevented each year by the elimination of tobacco smoking.

The habit of tobacco smoking has spread like an epidemic. Starting as a predominantly male phenomenon in the industrialized countries, it is now widely practised in the developing world, where cigarette smoking is the predominant form of tobacco use. Poor housing and environmental conditions, malnutrition, absence and inadequacy of legislative measures to control tobacco promotion and use, and the lack of public education and information about the dangers of tobacco make the populations in developing countries especially susceptible to an impending epidemic of tobacco-related diseases which include bladder cancer.

WHO has made recommendations on what should be the basic elements of a national tobacco control programme. Effective antismoking legislation should ban tobacco advertising and sales promotion, place warning labels and educational messages on packages containing tobacco products and advertisements, limit the amount of harmful substances in such products, increase taxation, protect minors and protect the rights of nonsmokers. To achieve this, the support of the medical community and politicians is essential. The educational component should use all available forms of mass media communication and should involve not only the general public, but also those in policy-making positions, leading trend-setting groups, medical and paramedical personnel, schoolchildren, workers in high-risk industries, and pregnant women. It should be integrated into the existing health care and educational systems.

Nordic countries have achieved perhaps the greatest levels of smoking control activities with comprehensive programmes of legislation, education and information. In Sweden, where strong comprehensive smoking control action was started in the early 1960s, followed by the introduction of health warnings on tobacco products in 1975, the proportion of daily smokers declined steadily between 1970 (50% of adult males) and 1984 (29%). Among 13-year-old boys, the percentage of smokers declined from 14% in 1971 to 5% in 1980; for 13-year-old girls the decline was from 16% to 6% over the same period.

When the Tobacco Act entered into force in Norway in 1975, 52% of adult males were daily smokers; but by 1982 the proportion had dropped to 40%. In 1974, 40% of boys and 41% of girls smoked daily, but in 1983 the figures were 21% and 26% respectively. Ten years after the beginning of the community programme for control of cardiovascular diseases in North Karelia, Finland, a 28% decrease was found in smoking prevalence among males and 14% among females.

At present, the prevalence of smoking among adults in Egypt is approximately 37% for men and 2% for women. The general trend in the African and eastern Mediterranean regions is increasing tobacco consumption. In the absence of strong and resolute government action, there is a considerable risk that an increase in bladder cancer due to smoking will make itself felt before bladder cancer associated with schistosomiasis will have been controlled.

Occupation

Benzidine, 2-naphthylamine, 4-aminobiphenyl, and auramine are "prohibited substances" or "controlled substances" under the Carcinogenic Substance Regulations of 1967 in the United Kingdom (14). Benzidine was used in the manufacture of dyestuffs and as a hardener in the rubber industry, thousands of tons being manufactured each year in the USA in the early 1970s. Commercial production had stopped in the USA and Japan by the late 1970s, but production is believed to be continuing in at least eight countries. The use of 2-naphthylamine was discontinued in Britain prior to 1960 and existing stocks were destroyed, but production continued in the USA and Japan until 1972. 4-aminobiphenyl was used as a rubber antioxidant for 20 years in the USA; 503 workers had been exposed to the substance and at least 35 developed carcinoma of the bladder. Production in the USA stopped shortly after publication of the first case of human bladder cancer following exposure. Auramine, used in the production of a yellow dye, apparently continues to be used widely (15). Regulations and control of carcinogenic substances related to bladder cancer are usually introduced in western countries soon after definitive evidence of risk to humans has been documented.

Schistosomiasis

For the purpose of this paper all initiatives for the control of schistosomiasis are classified as the primary prevention of bladder cancer. A number of control strategies for schistosomiasis have been identified, including health education, chemotherapy, sanitation and water supply, and snail control.

Health education is an important and integral part

of a schistosomiasis control programme since behavioural change can reduce the risk of infection and create a willingness to cooperate in a treatment regimen. The widespread use of improved latrines would also have an effect on transmission. However, it is often not easy to achieve appropriate behavioural changes within a short time. Active community participation is necessary to reduce contact with unsafe sources of water and ensure that long-term measures such as environmental improvements will be maintained.

Simple, rapid and economical techniques are available for the quantitative determination of *S. haematobium* infection by analysis of urine samples. Analysis of the intensity of infection, by counting the number of eggs per 10 ml of urine, rather than relying solely on the prevalence of infection, is necessary to evaluate the effectiveness of control programmes.

High cure rates are achieved following treatment with the recent antischistosomal drugs, praziquantel and metrifonate. Even if egg excretion persists after treatment, the intensity of infection and the risk of severe disease are greatly reduced. A single dose of praziquantel results in a cure rate of between 80% and 95%, with a reduction in egg count of 90–95% one year after treatment for those who are not cured. The drug is well tolerated and so far has been given to approximately one million persons. Metrifonate is usually given in three doses at two-week intervals and results in cure rates from 40% to more than 80%, with a 90% reduction in egg counts among individuals not cured. Different treatment approaches have been used in endemic areas according to the epidemiological characteristics (9). These approaches range from selective population chemotherapy (SPC), in which all infected persons of an entire community are treated after examination within a short period of time, to selected approaches in which schoolchildren or high-risk groups are treated after diagnosis.

Three methods of snail control—chemical, environmental and biological—have been used to control the snail host. At present, niclosamide is the molluscicide of choice. It is effective and non-toxic for mammals and aquatic organisms. Costs of mollusciciding are in the range of US\$ 1–4 per capita annually, and the cost-effectiveness is greatest where the volume of water to be treated per person at risk is small. However, increased tolerance to niclosamide has been reported.

Modification of the design of water-resource projects can assist schistosomiasis control by reducing the number of open canals and drains and hence direct human contact with water. In areas where open canal irrigation systems still operate, the periodic removal of vegetation from the canals or the

lining of canals with either rubber or cement (as is often done to prevent seepage or silting) reduces the size of the snail host population. Unnecessary water bodies can also be removed by filling-in or drainage and major water-contact sites such as a ford or children's play area can be restructured. Biological control by the introduction of competitor-snails is under investigation in a number of areas.

Schistosomiasis has been an increasing problem in Egypt following the building of the Aswan High Dam and changes in irrigation techniques. It is estimated that 33 million persons in Egypt are at risk of schistosomiasis infection. A number of major projects, involving area-wide mollusciciding and chemotherapy, have been implemented. In Fayoum, an area of 1.2 million inhabitants, the prevalence of *S. haematobium* infection was reduced from 45.7% in 1968 to 6% in 1975. In Middle Egypt, a population of 4.5 million is screened annually and metrifonate is given to those infected; prevalence dropped from 29.4% in 1977 to 11.5% in 1983. A similar project in Upper Egypt resulted in a drop in prevalence from 26.4% to 16% in a population of 5.1 million between 1980 and 1983.

A national schistosomiasis control project consisting of chemotherapy with praziquantel, snail control and health education was initiated in major endemic areas of the Congo in 1979. Prevalence of *S. haematobium* in treated areas was reduced from 49.2% in 1980 to 15.8% in 1983.

A reduction in prevalence from 50% to 11% in one year was seen in a zone of 50 000 persons in the Gezira Irrigation Scheme in Sudan following a programme of treatment with praziquantel, mollusciciding with niclosamide, weed removal, and health education (9).

EARLY DETECTION

The first sign for most people with bladder cancer is blood in the urine (haematuria). Pain upon urination and frequent urination are also common initial symptoms. The public should be educated to react quickly to such signs and seek medical advice because the cure rate for early bladder cancer is high.

Cystoscopy remains the most effective method of diagnosis for lesions large enough to be seen, but even small tumours represent a relatively "late" stage of the disease. Cytological examination of the urine, based on the method of Papanicolaou, has been widely used for screening for bladder cancer among workers in some industries since the 1950s, but requires careful attention to urine collection and processing methods; good results are obtained when carried out by a well-trained cytologist. In the United Kingdom, such screening is currently taking place in

the dye-manufacturing, rubber and other industries; in fact, for specific occupations regular screenings every 6 or 12 months for life are the accepted norm, regardless of evidence concerning its effectiveness. However, participation rates of only 60% for current workers and substantially lower rates for retired workers are often seen.

An investigation of cases of bladder cancer from a dye works in the United Kingdom has documented a shift to an earlier stage of disease and an improved survival among screened factory workers compared with hospital controls (16). However, because of the large potential biases that can cloud the evaluation of such early detection studies and the lack of a randomized trial evaluating mortality, it must be concluded that there is as yet insufficient evidence to show that such screening reduced mortality from bladder cancer (17).

Cytological examination of urine for the early detection of bladder cancer related to schistosomiasis has been studied in Egypt. Bladder carcinoma was detected in 11 individuals among 8744 screened in a rural Egyptian population. A shift to an earlier stage of disease was found in this feasibility investigation (18), but a follow-up study of effectiveness has not yet been conducted.

Urine cytology has many drawbacks, especially if only small numbers of cells are shed. The application of advanced technology, such as flow cytometry, is unlikely at present to improve the degree of discrimination. Other methods of examination, such as scanning electron microscopy, cannot yet identify single or small groups of desquamated, damaged cells, since there are no absolute ultrastructural markers of neoplasia. Because urinary cytology screening consumes considerable resources and definitive studies demonstrating a reduction of bladder cancer mortality are lacking, it should not be recommended for routine public health policy.

TREATMENT

Early (superficial) bladder cancer is curable in more than 80% of patients, while advanced disease that penetrates deeply into the bladder wall is difficult or impossible to cure; less than 20% of the latter survive five years. Prognosis and treatment depend on how deeply the cancer invades the bladder wall and the histological findings.

The current mainstay of treatment for bladder cancer is surgery. Tumours can be controlled by either transurethral resection or partial cystectomy, if they are confined to a single site within the bladder. Occasionally, the multiplicity of tumours precludes complete resection, and fulguration of the multiple

small lesions is carried out; however, tumour recurrence is the rule rather than the exception. After treatment, patients should be rescreened every 3–6 months by cystoscopy and urinary cytology.

Patients with carcinoma *in situ* treated by cystectomy have virtually a 100% rate of survival, provided the carcinoma does not invade the ureters or renal pelvis. However, patients who have diffuse invasion or metastases to the regional nodes have a poor prognosis.

Therapy for patients with bladder cancer which has invaded into the muscle remains rather controversial. Total cystectomy, with or without pelvic lymphadenectomy, has become the standard method of treatment. Results, however, are disappointing as cystectomy produces 5-year survival figures of approximately 20%. The fact that about 80 cystectomies in every 100 will not benefit is disturbing when one considers the mortality (5–10%) and morbidity (10–25%), including loss of sexual function, and the inevitable urinary diversion.

Radiation therapy alone has fallen from favour in the treatment of bladder cancer because not all such cancers are radio-sensitive and radiotherapy does not reverse the premalignant changes at other sites within the bladder. Some studies suggest a survival advantage for patients receiving preoperative radiotherapy followed by radical cystectomy (19), but patients who received preoperative radiotherapy have a higher incidence of pulmonary metastases as the first evidence of tumour dissemination. Combination therapy, furthermore, carries the morbidities of both therapies and is poorly tolerated by older patients, in whom no benefit is seen.

Chemotherapy and immunotherapy have not yet been proved to be of value for bladder cancer. Although some agents have been shown to shrink these tumours, the effect is so marginal that it is unlikely the patient will have an improvement in the quality of life except in rare instances, and it is likely that the majority of patients will have to compromise as regards their quality of life. Definitive randomized clinical trials of chemotherapy, immunotherapy or irradiation are needed before these therapies can be recommended routinely.

CONTROL STRATEGIES: OVERVIEW

Primary prevention holds the greatest promise for the reduction of mortality and morbidity from bladder cancer. Cigarette smoking is the major avoidable cause of bladder cancer worldwide today. Its elimination could reduce the number of bladder cancer cases by 50 000 to 75 000 per year. Further, the elimination of tobacco consumption would reduce

Table 3. Summary of recommended bladder cancer control strategies

Strategies	Mainly associated with tobacco and occupation	Mainly associated with schistosomiasis
Primary prevention	Comprehensive national tobacco control programmes, including health education and legislative components. Restrictions on commercial production and use of identified occupational carcinogens.	Comprehensive schistosomiasis control programmes, including chemotherapy, health education and snail control.
Early detection	Not recommended as routine public health policy; research is needed to demonstrate a reduction in mortality.	
Treatment	Surgery is the mainstay. Insufficient evidence on the effect of chemotherapy, immunotherapy or radiotherapy. Definitive clinical trials are needed.	

overall mortality from cancer globally by approximately one-third; more than one million premature deaths from cancer, cardiovascular disease, chronic bronchitis and emphysema each year are due to tobacco use. In schistosomiasis endemic areas, comprehensive programmes of health education, chemotherapy and snail control could prevent a further 5000 to 10 000 cases of bladder cancer per year. While the number of bladder cancers associated with occupation is relatively small, there is a major health risk for certain workers. Efforts to identify and control the responsible carcinogenic substances should continue (Table 3).

While evidence is lacking regarding the effective-

ness of bladder cancer early detection programmes, this approach has significant potential because of the high curability rates for early disease. Recommendations for routine health screening programmes must await the conduct of definitive cost-effectiveness studies.

Surgery is the mainstay of treatment for bladder cancer and results are good if the case is diagnosed before invasive disease develops. The extensive surgery necessary in advanced disease carries significant risk and morbidity and is curative only in a fraction of patients. Clinical trials involving radiotherapy, chemotherapy or immunotherapy are needed to improve upon current therapeutic results.

RÉSUMÉ

CANCER DE LA VESSIE: APPROCHES DE LA PRÉVENTION ET DE LA LUTTE

Dans le monde, le cancer de la vessie vient au douzième rang des cancers par sa fréquence, avec environ 170 000 nouveaux cas chaque année, dont un tiers surviennent dans les pays en développement. Il existe deux types étiologiques principaux, le premier, plus commun dans les pays industrialisés, étant associé à l'exposition à certains éléments cancérigènes du milieu professionnel ou de l'environnement, mais surtout au tabagisme. Le second type est associé à l'infection des voies urinaires par *Schistosoma haematobium* et constitue l'une des tumeurs les plus fréquentes en Méditerranée orientale et dans les pays africains. On peut tout à fait prévenir ces deux types de cancer.

Le tabagisme (cigarette) constitue aujourd'hui, partout dans le monde, la principale cause évitable de cancer de la vessie. Il est recommandé d'assurer une éducation sanitaire d'ensemble et d'envisager des approches législatives afin de lutter contre la consommation de tabac. Son élimination pourrait réduire de 50 000 à 75 000 par an le nombre de cas de cancers de la vessie. Dans les régions d'endémie de la

schistosomiase, des programmes d'ensemble comprenant éducation sanitaire, chimiothérapie et lutte contre les mollusques pourraient aider à prévenir quelque 5000 à 10 000 cas de cancers de la vessie par an. On dispose à l'heure actuelle de médicaments efficaces et sans danger pour traiter la schistosomiase. Bien que le nombre de cancers de la vessie associés à une activité professionnelle soit relativement faible, ce cancer représente un risque important pour la santé des personnes qui y sont exposées. Il faut poursuivre les efforts engagés pour repérer les substances cancérigènes qui en sont responsables et pour les éliminer.

Bien que l'on manque de données concernant l'efficacité des programmes de détection précoce du cancer de la vessie, cette approche possède un potentiel important en raison des taux de guérison élevés des affections précoces. Il faudra attendre les résultats des études de coût/efficacité pour formuler des recommandations relatives aux programmes de dépistage de routine en santé publique.

L'excision chirurgicale constitue la base du traitement

du cancer de la vessie et donne de bons résultats lorsque l'affection est diagnostiquée avant d'avoir atteint un stade invasif. Les importantes ablations chirurgicales nécessaires lorsque la maladie est avancée présentent plus de risques et

ne sont curatives que chez quelques malades. Il est impératif de procéder à des essais cliniques comprenant radiothérapie, chimiothérapie et immunothérapie afin d'essayer d'améliorer les résultats thérapeutiques actuels.

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