Management of advanced prostate cancer in Africa

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Background: *Carcinoma of the prostate (CaP) is the most common male malignancy in developed and developing countries and has been termed the "malignant epidemic of blacks." Despite this, clinicians managing men with advanced CaP in Africa have to contend with significant limitations in the healthcare systems. This article reviews the current and future options for the management of these patients on the African continent.*
Methods: *We searched PubMed and Google for articles on CaP with an emphasis on those focusing on subpopulation differences. Information was also obtained from ongoing studies and interviews with urologists and other specialists and executives in hospitals in our locality.*
Results: *In Africa, most patients with CaP present with advanced disease, and surgical castration is the most common treatment option, as most modern treatment strategies for the disease are unavailable or unaffordable. Unfortunately, a significant proportion of these men progress to hormone-resistant disease shortly after first-line hormonal treatment, and a majority die within 2 years. Problems that are peculiar to the African continent include poor health facilities, scarcity of expert care, high cost of treatment, lack of data, low level of awareness of the disease, absence of early detection and treatment programs, cultural limitations, and the prominence of alternative medical practice.*
Conclusion: *Most Africans with CaP present with advanced disease, and treatment is mostly limited to bilateral orchiectomy, but the results are poor. The care of these patients can be improved by increased funding of healthcare institutions and projects directed at prevention, early detection, and treatment.*

Key Words: prostate, prostate cancer, native African men, African health, palliative care

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This paper is dedicated to all African patients with prostate cancer and to those who care for them.

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Introduction

Carcinoma of the prostate (CaP) is the most commonly diagnosed male malignancy worldwide, and is now the second major cause of death from cancer in the United States.[1] CaP has been termed "the malignant epidemic of blacks," as the highest incidence of the disease has been recorded in native and migrant black subpopulations worldwide.[2-5] African-American men (AAM) are also twice as likely as Caucasian Americans to die from the disease,[6] and black men worldwide are more likely to present at a younger age with more

advanced disease and are known to have a poorer prognosis.[7,8]

In Africa, CaP represents 14%-22% of prostatitic diseases presenting to health institutions with a peak incidence in the seventh decade.[9-13] The commonest disease cell-type is adenocarcinoma (98%), with 34%-52% of adenocarcinomas being moderately or poorly differentiated.[10 13] Due to the absence of widespread CaP screening programs in African countries, almost all patients present with either irritative and/or obstructive lower urinary tract symptoms, while symptoms and signs of metastatic disease are seen in up to half of the patients.[7,14] At the final diagnosis at presentation, 50% to 80% of patients have advanced disease (T2-T4) at presentation with almost two-thirds having evidence distant/extra-capsular (M1) involvement.[2,7,15]

The late presentation of most CaP patients in Africa presents a challenge to healthcare practitioners (urologists and others). This paper reviews the management strategies currently available for advanced CaP in Africa, identifies the limitations, and proffers suggestions for improving the care of these patients.

Current management of advanced prostate cancer in developed countries

Most patients with CaP in developed countries have localized disease at presentation and are treated with radical surgery and radiotherapy with good results.[1] Advanced disease is seen at presentation only in a few cases (with blacks comprising a higher proportion of these), and only 15% of patients with localized disease who are treated with radical prostatectomy will progress to advanced stages at 10 years.[16] The Scher and Heller dynamic model of CaP is widely used to guide the management of CaP in the developed world.[17] This model divides CaP into five timelines (localized CaP, biological relapse, clinical metastatic non-castrate disease and clinical metastatic castrate disease and hormone refractory disease) and the last three are considered to be advanced disease. Treatment of this stage is mainly palliative and involves androgen ablation, usually by medical (anti-androgens and/or luteinizing hormone-releasing hormone (LHRH agonists) or rarely surgical castration, which is effective in 80% of patients.[1,18] Hormonal ablation therapy, however, is not curative, and the duration of response to the treatment rarely lasts more than 2 years.[19] Most patients will eventually develop resistance to first-line hormonal therapy and require second-line hormonal manipulation, which most respond to at least for awhile.[20] Symptomatic treatment with radiotherapy and bisphosphonates may also then be instituted. Although CaP was previously considered to be chemo-resistant, recent success has been reported with chemotherapy,[20,21] and these drugs have now being approved for use in the clinical setting.

Current management of advanced prostate cancer in Africa

In Africa as a whole, the protocol for the management of advanced CaP described above is inapplicable due to the limited availability of prostate-specific antigen (PSA) testing, and of radical surgery and radiotherapy as treatment options for locally advanced CaP.[22] As such, advanced stages of the disease are often determined clinically with minimal investigations and usually include locally advanced (inoperable/T2-T3) disease, along with metastatic and hormone-resistant disease. Most patients with CaP in Africa present with advanced disease and hormone ablation remains the only treatment of these stages of the disease in most of these patients. In contrast to developed countries, however, this is usually achieved with bilateral orchiectomy (75%) or stilboestrol, with only a few patients being treated with either anti-androgens (Flutamide/Casodex) or LHRH agonists).[14,15,23] Symptomatic treatment is also given as is required and could include analgesia, blood transfusion for anemia, channel- trans-urethral resection of the prostate (TURP) or catheterization for relief of urinary retention, and dialysis for correction of electrolyte derangement. Second-line treatment of hormone-resistant disease is usually with stilboestrol, or anti-androgens and/or LHRH agonists where available/affordable and not already utilized as first-line management. Bilateral orchiectomy has also been shown to be effective in a few patients in whom LHRH-induced combined androgen blockade has failed and who have normal serum testosterone.[24] External beam radiotherapy is available for palliative care in a few centers. Chemotherapy has recently been introduced to the African continent, but it is only available in a few cities.

Similar to results in the developed nations, symptomatic improvement occurs in up to 80% of patients following first-line hormonal ablation, including full (50%-78%) or partial (22%) recovery of function in almost all of those who present with paraplegia.[14,15,25] In contrast to the developed word, however, despite the initial positive response, the prognosis of native African men (NAM) with CaP is poor, and the overall death rate has been cited as being as high as 64% in 2 years.[2] The survival rate of patients with well-differentiated cancers

is, however, quite good with a > 80% 4-year survival, compared to 0%-33% of patients with moderate-to-poorly differentiated cancers.[15,23] Patients with neurological deficits have the worst prognosis with 44% dying within 6 months of presentation.[25]

Limitations to the effective management of advanced prostate cancer in Africa

The goals of the management of patients with advanced CaP in Africa are similar to those in all other diseases and in other parts of the world. However, there are peculiar challenges to achieving this objective in the management of this stage of CaP on the African continent.[22]

Peculiarities of CaP in Black men (native Africans and African-American men)

The aggressive nature of CaP in black men is a limitation to effective management of the advanced stages of the disease in Africa. This is because men of the subpopulation have less favorable postoperative outcomes compared to others.[1,26,27] Interestingly histo-pathological comparative studies of CaP in (Nigerian) native African men (NAM) and AAM reported that the peak age of NAM men at diagnosis with CaP was significantly lower than AAM, and that a significantly greater proportion of NAM presented with advanced disease as compared to AAM.[28,29] Thus, the unfavorable phenotype observed in the black subpopulation with CaP may be even more pronounced in the native African population.

Poorly funded and inadequate healthcare systems

Most people in Africa are poorly educated and poorly informed about health issues including CaP,[30] resulting in late presentation to hospitals. Furthermore, attendance of patients at these health facilities is reducing due to a multitude of factors, Table 1 prominent amongst which are the high cost of treatment (which is borne almost completely by the patient and his/her family due to the absence of health insurance in most countries,[31] and the patient/community unfriendliness of the hospital protocols and staff. Hence, most patients prefer to patronize alternative medical practitioners (traditional and faith healers or other alternative health providers) who are considered cheaper, friendlier, and more accessible.

Poor funding of tertiary and specialist hospitals

In the midst of the poor funding of the health systems in Africa, tertiary and specialist institutions are even more poorly funded as a policy of most governments on the continent. This is due, in part, to a World Bank's report that called for 'a reduction of government expenditure in tertiary facilities, specialist training, and intervention that provide little gain for money spent'.[32] This policy has had the following effects:

TABLE 1. **Factors responsible for the reduction of patient attendance of orthodox hospitals in Africa**

1. The number of general and specialists are too few for the populations they serve
2. The urban location of most of the specialist hospitals makes them distant and difficult to access by the majority of the population
3. Poor funding of these institutions resulting in inadequate infrastructure and equipment which are poorly maintained and are therefore frequently non-functional
4. Patients often require multiple visits in the course of their investigations and treatment (may be further prolonged by equipment failures).
5. High cost of health care which is unaffordable by majority of the people and is further increased by the cost of travelling to and from hospital visits.
6. The hospital staff and protocols are socially unresponsive (community/patient unfriendly)
   - Use of foreign languages for communication (by staff) and for hospital operating systems
   - Lack of patient information leaflets
   - Limited information given to patients and families about their diseases and plans of action
   - Lack of consideration of the culture and religion of the patient or community
   - Limited signs to direct patients around hospital
   - Inadequate hospital beds
   - Poor facilities for traveling patients and accompanying family members
7. Absence of, or poorly organized, patient support groups.

a) A significant number of primary health[33] and tertiary and training institutions[34] now run 'cost-recovery' programs that have further driven orthodox care out of the reach of the average African patient . A recent study has shown that more than half of patients admitted to a hospital in Northern Nigeria had to sell personal and family assets to be able to pay the admission fees, while 20% and 10% could only come up with the funds after a month and a year, respectively.[35] But most disturbing of all, 16% had to abandon treatment due to their inability to afford unforeseen costs of their care. Not surprisingly, government hospitals have acquired the reputation of being neocolonialist and extortionist.

b) There is a shortage of medical specialists and other support healthcare practitioners required for optimal management of CaP patients in Africa. This is because relatively few urologists, other specialists, and support staff are trained on the continent, and a significant proportion of those trained migrate to the developed countries during, or after completing, their residency programs (i.e. the brain drain).[36] Worse still is that the quality of training is now being affected by the decreased number of patients attending training institutions (as mentioned above) and the inability of those who do attend to afford the costs of prescribed investigations and treatment.[34] These factors make accurate diagnosis, staging, and effective treatment of patients with all stages of cancers difficult. In addition, most specialists who remain on the African continent are located almost exclusively in the cities, whereas most of the populace dwell in rural areas, creating access problems for the patients.

c) Modern investigations (such as bone, CT and MRI scans), modern drugs (e.g. bisphosphonates, taxel-based drugs and opiates), radiotherapy, and other supportive treatments are largely unavailable in Africa,[14,22] and where available are too expensive for most patients to afford (e.g. in Nigeria the cost of a course of docetaxel is over 15 times the cost of a monthly dose of stilboestrol and more than 10 times the minimum monthly wage). As a result, often times all that can be offered is a clinical examination, a few basic investigations (± biopsy) and bilateral orchiectomy in the first instance, and when the disease becomes hormone resistant, most patients are simply unable to afford anything other than simple analgesics, as even opiates are either unavailable or beyond their reach. Consequently, as mentioned above, these patients are sometimes abandoned by their families due to their inability to pay for their care.[35]

d) Palliative care is established in only a few African countries (South Africa, Uganda, Kenya, Zimbabwe, and Egypt) and is largely unknown in the rest of the continent.[37] As such, most patients with advanced cancers (including CaP) do not have access to palliative care facilities or specialists, especially since most African hospitals do not have hospice facilities, palliative-care strategies, or protocols, and their staff are largely untrained in the specialty.[38] This has meant that most terminally-ill African patients are discharged into the care of their families who are mostly unable to cope with the demands (financial, psychological, and nursing) in the home settings, further alienating orthodox hospitals and physicians from the community.

Peculiarities of the African culture

The lack of awareness of the disease mentioned above is not limited to the patient alone but to the entire family and community, which largely remains distrustful of orthodox medicine and its practitioners. Thus patients are more likely to be directed to the 'trusted' and 'friendly' traditional/alternative health practitioners, thus delaying their presentation to the hospital. Unfortunately, some of these practitioners are quacks.[34] Furthermore, there is a high usage rate of nonstandardized and unregulated complimentary and alternative medications amongst advanced CaP patients, which may counteract or synergize the desired effects of orthodox medicines, or result in complications, all of which worsen the patient's situation, which is then blamed on the orthodox drugs and/or physician.

Limited research and published data

Little is known about the epidemiology and natural history of CaP in NAM due to insufficient research and published data in the literature. In addition, the information in the published papers often do not use standardized indices and/or are not detailed enough to allow comparison with papers from other parts of the world. There is also a discrepancy between the (low) ranking of African countries in the World Health Organization (WHO) CaP statistics and the (high) incidence published from the countries.[39] The former has led to the relatively poor interest of the international agencies in funding research projects about the disease on the continent.

Lack of effective homegrown healthcare policies

The poor culture of data collection in Africa makes healthcare planning complicated and difficult. Consequently most African countries do not have adequately-planned, well-resourced, homegrown national healthcare policies and strategies. In the absence of effective homegrown healthcare and training policies, most of these nations adopt healthcare policies designed in foreign nations, sometimes without adapting them to the peculiarities of their communities, thereby making the policies unacceptable and ineffective.

Lack of awareness, early detection, and treatment and prevention programs

Like other black men,[40] NAM have a poor knowledge of CaP and the methods of its early detection and screening.[30] The lack of counselors and public-health educators trained in CaP detection and care has also meant the absence of community outreach programs to disseminate such knowledge. Further, although the value of PSA screening is now being debated,[41] its value in monitoring CaP is without question. However, few African nations have standardized PSA reference values for their community,[42] and worse still, black Africans with elevated PSAs are reluctant to undergo prostate biopsies.[43] Cancer prevention is also virtually unknown in Africa. As such, native African blacks continue to consume high-fat diets and are obese (factor that have been closely associated with the invasiveness and progression of CaP[44,45]) and are not involved in any of the chemoprevention studies (Prostate Cancer Prevention Trial [PCPT][46] or The Selenium and Vitamin E Cancer Prevention Trial [SELECT][47]).

Politics and prostate cancer research

There is a glaring disparity in the funding given to CaP, breast cancer, and HIV/AIDS. In the United States, the comparative amounts invested in each life lost to the three diseases are: $16700 for CaP, $21800 for breast cancer, and $160000 for AIDS.[48] This relative lack of interest in CaP by the scientific community in general and the international research funding agencies in particular has meant that there is even less interest in providing funds for CaP research and its management in Africa.

The way forward

Prostate cancer is a major healthcare problem in Africa and initiatives for improving its management (especially the advanced stages) are urgently required. These programs would include, but would not be limited to the improvement on, or reversal of, the limitations listed above. However, it would be difficult to improve the care of these patients in isolation. The measures described below are therefore directed toward improving healthcare on the African continent generally and the management of (advanced) CaP specifically.

Improving healthcare in Africa

This can be achieved by:

a) Improving the performance/function of African healthcare institutions.

i. *Improved funding* – The health budgets of most African nations are between 3%-10%,[31] see Table 2, and therefore need to be increased, as they are below the African Union recommendation of 15%.[49] Most importantly, a reversal of the World Bank's advice[32] is required, and more funds need to be spent on tertiary and specialist hospitals. In addition, a policy on national health insurance is required in all countries on the continent. This scheme would ensure the provision of affordable, efficient, equal access healthcare to those whose income would enable them to afford the contributions, with the governments taking on the responsibility for those who cannot afford the cost of insurance.

ii. *Making the hospitals more patient-friendly* – There is a need to develop culturally-oriented hospital environments and patient and family awareness and treatment programs. Improved staff attitudes and access to these facilities, especially for patients in the rural areas, must also be emphasized.

iii. *Capacity building (employment and training) of healthcare specialists especially urologists, medical oncology and palliative care teams (including nurses, counselors, etc.)* - This should be done with a view to developing homegrown interdisciplinary management protocols for the treatment of oncology patients. Frantic efforts must be also made by all governments in the continent to reduce and eventually reverse the brain drain.

b) Development of culture-friendly, homegrown healthcare policies with achievable objectives, which should also be formulated with the involvement of all stakeholders, especially the people and their leaders. Also to be included are outreach programs during which the ethos of orthodox healthcare practices and policies are explained to those in the communities. For example, a small survey in our department revealed that orchiectomy is acceptable to most African men if they are properly counseled about the benefits and side effects (unpublished data).

TABLE 2. **Health Expenditure in Africa**[31]

Country	THE* as % of GDP	GGEH as % of TEH	PEH as % of TEH	GGEH as % of TEH	ERH as % of TEH	SSEH as % of GGEH	OPE as % of PEH
Algeria	3.6	72.5	27.5	8.4	0.0	33.2	94.60
Libya	3.8	74.9	25.1	6.1	0.0	n/a	100.0
Egypt	6.1	38.2	61.8	7.9	0.9	26.7	94.3
Tunisia	6.2	52.1	47.9	8.8	0.2	19.4	83.00
Morocco	5.1	34.3	65.7	5.5	0.9	0.0	76.00
Nigeria	4.6	30.4	69.6	3.5	5.6	0.0	90.40
Cameroun	5.2	28.0	72.0	10.5	5.3	0.0	94.50
Chad	4.2	36.9	63.1	9.5	7.0	n/a	95.80
Niger	4.2	52.5	47.5	10.3	21.3	n/a	85.10
Mali	6.6	49.2	50.8	12.8	13.8	n/a	99.50
Benin	4.9	51.2	48.8	9.8	10.2	n/a	99.9
Togo	5.5	20.7	79.3	6.9	8.9	14.4	84.90
Ghana	6.7	42.2	57.8	8.4	29.9	n/a	78.2
Burkina Faso	6.1	54.8	45.2	15.3	26.8	0.4	97.90
Cote d'Ivoire	3.8	23.8	76.2	4.6	5.0	n/a	88.70
Liberia	5.6	63.9	36.1	20.1	37.8	0.0	98.50
Guinea	5.3	13.2	86.8	4.5	9.5	1.6	99.50
Sierra Leone	3.3	59.0	41.0	7.8	35.4	0.0	100.0
Guinea Bissau	4.8	27.3	72.7	3.5	31.6	3.5	90.0
Gambia	6.8	27.1	72.9	5.9	23.0	0.0	68.20
Senegal	5.9	40.3	59.7	9.8	12.8	14.7	94.50
Mauritania	2.9	69.4	30.6	5.3	20.2	0.0	100.00
Ethiopia	5.3	51.5	48.5	9.4	35.2	0.4	78.30
Eritrea	4.5	39.2	60.8	4.2	59.6	0.0	100.00
Sudan	4.1	35.4	64.6	7.2	5.1	12.5	98.10
Kenya	4.1	42.7	57.3	8.2	18.3	8.4	81.90
Uganda	7.6	32.7	67.3	10.0	25.2	0.0	51.30
Rwanda	7.5	56.8	43.2	16.5	37.1	4.6	36.9
Burundi	3.2	26.2	73.8	2.3	17.6	n/a	100.00
Tanzania	4.0	43.6	56.4	8.5	27.1	1.8	83.20
Congo	2.5	49.2	50.8	4.4	3.6	0.0	100.00
Gabon	4.5	68.8	31.2	13.9	1.3	1.7	100.00
Equatorial Guinea	1.6	77.1	22.9	7.0	3.8	0.0	75.10
Central African Rep.	4.1	36.8	63.2	10.9	47.7	n/a	95.40
Angola	1.9	79.4	20.6	4.4	9.1	0.0	100.0
Botswana	6.4	62.9	37.1	10.5	2.5	n/a	27.9
Namibia	6.8	69.0	31.0	13.5	16.9	1.7	18.10
Malawi	12.9	74.7	25.3	28.8	59.4	0.0	35.2
Mozambique	4.0	68.4	31.6	9.1	55.9	0.0	38.5
Madagascar	3.0	59.1	40.9	8.7	45.5	n/a	52.50
South Africa	8.6	40.4	59.6	10.8	0.5	4.3	17.2
Zimbabwe	7.5	46.1	53.9	8.9	13.1	0.0	48.7
Lesotho	6.5	84.2	15.8	13.4	8.7	0.0	18.20

Note* - TEH = Total expenditure on health, GDP = Gross domestic product, GGEH = General government expenditure on health, PEH = Private expenditure on health, ERH = External resources for health, SSEH = Social security expenditure on health, OPE = out-of-pocket expenditure on health.

c) In light of the culture and widespread use of alternative and traditional medications amongst patients in Africa, governments must reach out to alternative and traditional medical practitioners with a view to standardizing and integrating their practice into the national health policies. These fields should also be included in the curriculum of medical schools.

d) Improved data collection in Africa can be achieved by better documentation and record keeping in hospitals and other healthcare facilities and during research projects. This would result in publications of higher standards with improved knowledge of the epidemiology of diseases and would also provide support for applications for grants from national and international funding agencies.

e) Similar to current trends in the developed world, cancer prevention is a must in Africa. As such, programs about a healthy diet and lifestyle should be emphasized, as diet is known to be responsible for approximately 30%-50% of all cancers.[50] These efforts should also include research into the genetic and epigenetic factors involved in cancers as well as their biomarkers, with a view to identifying targets for preventive intervention.[51-53] Oncologists in African should also take advantage of established training workshops/programs in cancer prevention such as the Summer Curriculum in Cancer Prevention of the National Cancer Institute (http://cancer.gov/prevention/pob).

f) Recognition of palliative care as a specialty and establishment of palliative care centers and care-in-the-community programs to improve the care of patients with advanced cancer. Healthcare practitioners should also be taught about end-of-life issues as part of their training.

Improving care of CaP patients

a) Institution of awareness and early detection and treatment programs are a priority for Africa, as late presentation is a major contributor to the poor prognosis of the disease on the continent. Fortunately, health education programs have been shown to improve the knowledge and awareness of CaP and its early detection and treatment in NAM.[53] Prior to the establishment of CaP screening programs, however, there is a need to have PSA reference levels determined for Africans, as reports on mean PSA values in NAM as compared to AAM and Caucasian American men (CAM) are conflicting.[7-42] In addition, markedly elevated PSA levels in NAM may be due to chronic prostatitis and not CaP.[55]

b) Repositioning CaP in research and funding.

i. National and international governments and scientific bodies should take due cognizance of the health burden posed by CaP both as a reproductive and a noncommunicable disease in Africa. Such recognition should result in an increase in the publicity and funding for research projects into all aspects (basic, clinical, and public health science) of the disease and its management on the continent. Importantly, more comparative studies of the indices of the disease are required between NAM and blacks in the diaspora in order to determine the effects of genetic and epigenetic factors on the natural history of the disease.

ii. Modern anti-CaP drugs/strategies should be provided at subsidized rates in Africa. Furthermore, phase III trials of these drugs should be carried out in African prior to their introduction as effective treatment, to detect any differences in drug kinetics. The assistance of international health organizations such as the World Health Organization (WHO), African Organization for Research and Training in Cancer (AORTIC) and Pan African Urological Surgeons Association (PAUSA) should be enlisted to support these initiatives.

iii. Prostate cancer prevention programs and organizations similar to those in the developed countries (e.g. Alliance for Prostate Cancer Prevention [APCaP] www.apcap.org. must be established in Africa. These would provide information on the disease and its prevention to the general public via the electronic and print media and via community outreach projects. Africa should also be included in chemopreventive programs,[46] especially those involving diet.[47] These efforts should also include research into factors involved in the initiation and progression of CaP in Africans as well as the determinants of its aggressive biology in the subpopulation.[56] Furthermore, targets for modern molecular interventions should also be identified in CaP in Africans.[57]

Making progress slowly

Despite the limitations in the management of CaP in Africa, some progress is being made in the care of patients with advanced CaP. Notable amongst these are:

1) The increasing awareness of the magnitude of the problem posed by CaP by governmental and nongovernmental policy makers, healthcare managers, and the public.
2) The increase in demand and funds for the care of the elderly in whom cancers (including CaP) are more prevalent, due to the (slowly) increasing life expectancy and economic power in Africa.[58]
3) There is increasing research into basic and public health science of CaP in NAM.[7,12,42,59,60]
4) Health insurance schemes are now being introduced in African countries (e.g. Nigeria).[61]
5) Palliative care is now being recognized as a specialty in Africa and hospices and palliative care programs are being established across the continent.[38,62]

Conclusion

Most patients with CaP in Africa have advanced disease, and their management is presently unsatisfactory, for which the inadequate and materialistic operation of the health systems are partly to blame. As such, the quality of life and the prognosis of these patients are poor. CaP is a major reproductive and general men's health burden in Africa and should be recognized as such, as this would result in the initiation or improvement of (research and treatment) programs that would improve the care of the patients. Research projects to determine the epidemiology of CaP in Africa and the role of genetic/ethnic and environmental factors in the natural history of the disease in NAM are required as are comparative studies with blacks in the diaspora. Better funded and staffed patient-friendly hospitals, hospices, and community-health centers that are accessible to most patients are a priority, as are culturally acceptable health policies that involve the alternative and traditional healthcare practitioners. Equally important are health education programs that emphasize prevention and early detection and treatment of CaP. □

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