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Penile Cancer In India: A Clinicoepidemiological Study

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Maulana Azad Medical College, New Delhi, India

Abstract

Introduction

Penile cancer is one of the most common genitourinary cancers encountered in developing countries like India. The incidence of carcinoma of the penis varies according to circumcision practice, hygienic standard, phimosis, the number of sexual partners, HPV infection, exposure to tobacco products, and other factors. The aim of the study was to study the clinic-epidemiological profile of penile cancer.

Materials and methods:

54 patients were enrolled and studied from May 2005 to June 2006. Clinicoepidemiologic profile and patients’ characteristics were assessed in a questionnaire including demographic data, presence of risk factors like smoking, phimosis, circumcision, history of promiscuity, history of sexually transmitted disease etc., clinical features, pathological features of tumor like size, site, appearance, histological type, grade, presence of lymph nodes, treatment performed and response. 5 year survival rates were also calculated.

Results:

Of the 54 patients, about three-fourths patients were older than 50. About one quarter patients presented with phimosis and 20% patients had undergone circumcision after attaining adulthood. 70% patients were found to be smokers. Most patients presented with T2 disease whereas lymphadenopathy, both benign and malignant, was present in 55.5% and 76% patients in T1 and T2 patients respectively. 5 year survival rates were found to be 87% and 60% respectively in stage I and II respectively.

Conclusion:

Penile cancer is one of the most common genitourinary cancer affecting mostly aged, uncircumcised males with history of smoking. Most patients present at advanced age and hence a national awareness campaign against this disease should be promoted.

Keywords
penile cancer, circumcision, phimosis, HPV, sexually transmitted diseases

Introduction

Genitourinary tract cancers are one of the most common malignancies in males. In an epidemiology study by Nagpal et al, the incidence of male genital tract represented 16.33% of all male malignancies. The relative frequency of malignant tumors of various organs in the male genital tract was penis, 42.49%; prostate, 40.34%; testis, 15.92%; scrotum, 0.71%; epididymis, 0.36%; spermatic cord, 0.09%; and urethra, 0.09% (1). Penile cancer is uncommon in the western world but not so in the third world or in its immigrants to Europe and America. In the United States, penile cancer accounts for less than 1% of all cancers in men and the annual, average age-adjusted incidence rate was 0.81 cases per 100,000 men (2).

One of the highest world incidence is found in India with rates of 3.32/100,000 inhabitants, and the lowest incidence is in Jewish men born in Israel with rates close to zero (3). The incidence of carcinoma of the penis varies according to circumcision practice, hygienic standard, phimosis, number of sexual partners, HPV infection, exposure to tobacco products, and other factors (4-6). Although up to 15% of
cases occur in men younger than 50 years, penile cancer is a disease of older men, with a median age at diagnosis in the United States of 68 years and with an increased risk as the age advances beyond 50 years \(^{(7)}\).

Human papilloma virus (HPV) infection is identified in about half of the men with penile cancer and some HPV subtypes (such as HPV-16 and HPV-18) have been associated with malignant transformation of condyloma acuminate\(^{(8)}\). Sexual behaviors such as high number of lifetime partners also confer additional risk of penile cancer \(^{(4, 5)}\). Human immunodeficiency virus (HIV) is associated with an 8-fold increased risk of penile cancer, but this may be mediated to an extent by the higher incidence of HPV among men with HIV \(^{(9)}\). Cigarette smokers are 3 to 4.5 times more likely to develop penile carcinoma than non-smokers \(^{(5, 6)}\) and users of other tobacco products are also at increased risk \(^{(10)}\).

Data from most large series show that penile cancer is rare among neonatally circumcised individuals but more frequent when circumcision is delayed until puberty\(^{(11-13)}\). Similarly, Paymaster and Gangadharan \(^{(14)}\) reported an incidence of 3.3% among non-circumcised individuals and 0% in those circumcised after birth.

**Material and methods**

Over the period from May 2006 to June 2007, an epidemiological study was conducted in a tertiary center in New Delhi to further elucidate the incidence, risk factors, and patient characteristics of newly diagnosed penile cancer patients within India.

The patients’ clinical and epidemiological data were assessed in the questionnaire: age, religion, place of residence, occupation, history and type of sexually transmitted diseases, presence of phimosis, age the circumcision was performed (childhood, adolescence and adulthood), tobacco smoking and duration, predisposing lesions, presenting complaints, the anatomical pathological characteristics of the tumor, such as the histological type, grade, localization of the lesion (glans, prepuce, corpus, shaft or the entire penis); size of the lesion; presence of palpable inguinal lymph nodes; stage of the disease; presence and localization of metastasis and the type of treatment performed, if surgical (partial penectomy, radical penectomy, lymphadenectomy) or palliative (chemotherapy, radiotherapy). Informed consent was taken from all the patients and the study design was approved from the ethics committee.

**Results**

A total of 54 patients were enrolled in our study from May 2005 until June 2006. Mean age of the patients was 56.11 years (range 33-82). Most of the patients were aged more than 50 years (n=39;72.11%). The study group had 72.8% Hindus while the rest of the patients comprised of Christians, Sikhs and others. 61.1% of the patients were engaged in farming while others belonged to varied professions. (Table 1)

19.5% (n=10) patients had history of circumcision whereas 25.9% (n=14) patients presented with phimosis. Of the 10 patients who had circumcision, none had circumcision at birth and all of them had it done in adulthood. History of promiscuity could be elicited from

<table>
<thead>
<tr>
<th>Total no. of patients</th>
<th>54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean/range)</td>
<td>56.11(33-82)</td>
</tr>
<tr>
<td>&lt;50 yrs</td>
<td>27.89%</td>
</tr>
<tr>
<td>&gt;50 yrs</td>
<td>72.11%</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>72.8%</td>
</tr>
<tr>
<td>Muslims</td>
<td>0</td>
</tr>
<tr>
<td>Others</td>
<td>27.2%</td>
</tr>
<tr>
<td>H/o circumcision</td>
<td>19.5%</td>
</tr>
<tr>
<td>H/o STD</td>
<td>13.7%</td>
</tr>
<tr>
<td>Site</td>
<td></td>
</tr>
<tr>
<td>Glans</td>
<td>60%</td>
</tr>
<tr>
<td>Prepuce</td>
<td>32%</td>
</tr>
<tr>
<td>Shaft</td>
<td>8%</td>
</tr>
<tr>
<td>Stage(n)</td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>30</td>
</tr>
<tr>
<td>T2</td>
<td>18</td>
</tr>
<tr>
<td>T3 or more</td>
<td>6</td>
</tr>
<tr>
<td>Prevalence of lymphadenopathy (stagewise)</td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>20%</td>
</tr>
<tr>
<td>T2</td>
<td>60.8%</td>
</tr>
<tr>
<td>T3 or more</td>
<td>83.3%</td>
</tr>
<tr>
<td>5-year survival</td>
<td></td>
</tr>
<tr>
<td>Stage 1</td>
<td>87%</td>
</tr>
<tr>
<td>Stage 2</td>
<td>60.00%</td>
</tr>
</tbody>
</table>

| Table 1: Demographic characteristics of the patient |
only about 15% of patients whereas 13.7% patients had history of some kind of STD, exact nature of which could not be elicited from the past records. Nearly 70% of patients admitted to consume tobacco either as smoking or chewing.

The predisposing lesions were found to be induration, erythema, warts and naevus in that order. The most common presenting lesion was fungating growth overlying glans and prepuce followed by nodularity and ulceration. Glans (60%) followed by prepuce (32%) was the most common site for growth. Majority of patients presented with early stage tumor, T2 being the most common (55.5%) followed by T1 (33.33%). T4 was present in 3 patients who also had pelvic lymphadenopathy (n=3) and paraaortic lymph nodes (n=2). Lymph nodes were palpable in 38 patients, out of which 21 were positive for metastasis. Inguinal lymphadenopathy was present in 55.55% and 76.6% patients with T1 and T2 tumors respectively while prevalence of positive lymph nodes was estimated to be around 20%, 60.8% and 83.3% in patients with T1, T2 and T3 or higher respectively. 78% of patients had low grade tumor (grade 1 and 2) on histopathological evaluation. 5 year survival rates were 87% and 60% for stage I and II tumors respectively.

Discussion

Penile cancer is a rare disease in industrialized countries. In contrast, penile carcinoma is a far more serious health problem in less developed areas of the world, such as parts of Africa, Asia and South America. In urban India, the age-adjusted incidence of penile cancer ranges from 0.7-2.3 cases per 100,000 men. In rural India, the rate of penile cancer is 3 cases per 100,000 men, accounting for more than 6% of all malignancies in this population (15).

Penile cancer is most frequent in the sixth decade of life (3). However, it can occur in younger men as suggested in one of the prospective study (16). In our study, more than 70% patients were more than 50 years of age. Phimosis is one of the most important predisposing factors for penile cancer. 26% patients had phimosis on examination in our study. In one review of published case control studies, the presence of phimosis increased the risk of penile cancer more than 10-fold (17). 20% patients had circumcision done in adulthood in our study and all of them developed low grade carcinoma. None of the patients in our series had circumcision at birth, hence suggesting the protective role it plays when performed in perinatal period. In a case-control study that included 110 men with penile cancer and 355 control subjects, the relative risks of penile cancer for uncircumcised men and for those circumcised after infancy were 3.0 and 3.2, respectively, compared to men circumcised at birth (5). Possible mechanisms by which circumcision may decrease the incidence of penile cancer include avoiding the development of phimosis and preventing the retention of smegma. Cigarette smokers are at increased risk of penile carcinoma (5, 6, 17). In population-based case control studies, smokers were 3 to 4.5 times more likely to have penile cancer compared to non-smokers (5, 6). In our study, more than 70% patients were smokers and most of them had been doing it for more than 20 years, hence underlining the importance of smoking as an important risk factor for penile cancer.

In accordance with the results of previous reviews, the most common clinical presentation in our series was fungating growth followed by ulceration with glans being the most commonly affected site. This observation further emphasizes the etiologic role that smegma and phimosis play in development of penile cancer. Most patients presented at stage 2 (55%) and delay seeking medical attention due to embarrassment, fear, ignorance or guilt. This finding is of grave concern as it is well known that advanced disease is strongly correlated with degree of invasion and probability of regional and systemic metastases suggesting a worse prognosis for these patients (18). Prevalence of lymphadenopathy has been estimated to be 20-96% in penile cancer patients (19). In one series of 37 men with penile cancer, positive lymph nodes were found in 11 percent of T1 tumors, 63 percent of T2-3 tumors, and 15, 67, and 75 percent of those with grade 1, 2, or 3 lesions respectively correlating well with our results (20).
The key points to emerge out of our study are that penile cancer can be observed in young patients and secondly, that patients present at more advanced stage either because of lack of awareness, embarrassment, fear or lack of access to specialized care. This calls for an increased awareness through a national campaign to educate the public about this poorly known disease.

References


