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Urinary Bladder Cancer and Schistosomiasis in North-Western Nigeria

Cancer Urinaire de Vessie et Schistosomiasis dans Nigeria du Nord-Ouest

I.A. Mungadi *, S.A. Malami†

ABSTRACT
BACKGROUND: An unusually high prevalence of bladder cancer was noticed by clinicians and in the cancer registry of Usmanu Danfodiyo University Teaching Hospital, Sokoto. Several areas of this region were also known to be endemic for urinary schistosomiasis.
OBJECTIVE: To determine the epidemiological characteristics of bladder cancer in the region and to assess the impact of schistosomiasis on these cases.
METHOD: Retrospective review of clinical and histopathological records of bladder cancer cases seen at Usmanu Danfodiyo University Teaching Hospital, Sokoto from January 1999 to December 2004.
RESULT: One hundred and thirty cases satisfied our criteria for inclusion. There was a 4.7 fold rise in the number of bladder cancer cases between 1999 and 2004. The male to female ratio was 11.1:1.0. The mean age was 46.0 years and ranged from 20 to 82 years. Majority, 107 (80.5%) were farmers and fishermen from regions of the distribution of surrounding river or their smaller tributaries. Squamous Cell Carcinoma comprised 65.1% of histologically verified cases and in 50% of Squamous Cell Carcinoma; there was histological evidence of chronic urinary schistosomiasis.
CONCLUSION: Bladder cancer is a common malignancy in Sokoto, North-Western Nigeria. The association with chronic urinary schistosomiasis is very strong and the hospital incidence appears to be rising.

Keywords: Urinary bladder, Squamous Cell Carcinoma, Schistosomiasis, North-western Nigeria.

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Abbreviations: SCC, squamous cell carcinoma; TCC, transitional cell carcinoma

RESUMÉ
Contexte: Une prédominance insolite de cancer de vessie a été remarquée par les praticiens et dans l’enregistrement de cancer d’Hôpital d’Enseignement d’Université de Danfodiyo d’Usmanu, Sokoto. Plusieurs secteurs de cette région ont été sus sus aussi pour être endémiques pour schistosomiasis urinaire. Cette étude a été entreprise de déterminer les caractéristiques épidémiologiques de cancer de vessie dans la région et évaluer l’impact de schistosomiasis sur ces cas.
Méthodes: La revue de clinique et dossiers de de histopathologique 133 cancer de vessie reconnaît vu à l’Hôpital d'Enseignement d'Université de Danfodiyo d'Usmanu, Sokoto du 1999 janvier au 2004 décembre.
Résultat: Cent et trente trois cas ont satisfait nos critères pour l'inclusion. Il y avait un régulier 4.7 ascension de pli dans le nombre de cas de cancer de vessie entre 1999 et 2004. Le mâle à la proportion femelle était 11.1:1.0. L'âge moyen était 46,0 années et étendu de 20 à 82 années. La majorité, 107 (80.5%) étaient des agriculteurs et des pêcheurs des régions de la distribution de rivières Rima, Sokoto, Ka, Niger ou leurs plus petits affluents. Le Carcinome de Cellule de Squamous (SCC) a compris 65,1% de cas histologiquement vériﬁés et dans 50% de SCC; il y avait de la preuve histologique de schistosomiasis urinaire chronique.

Mots clés : La vessie urinaire, le Carcinome de Cellule de Squamous, Schistosomiasis, Nigèria du nord-ouest.
INTRODUCTION

The causal relationship between urinary schistosomiasis and bladder cancer was first reported by Fergusson.¹ There is now a compelling body of evidence on the contribution of chronic urinary bladder schistosomiasis to the aetiopathogenesis of urinary bladder cancer.²⁻⁴ In the Western world, carcinoma of the bladder is the fourth most common cancer in men accounting for 6.2% of all cancer cases and the eighth most common cancer in females, accounting for 2.5% of cancer cases.⁵ In Egypt, parts of Middle East and areas where schistosomiasis is endemic, carcinoma of the bladder has been reported to be the most common cancer in males.⁶

Different mechanisms for schistosoma-induced bladder cancer have been suggested. No direct carcinogenic product from the parasite has been isolated. Current evidence suggests enhanced inflammatory cells and bacterial nitration of endogenous nitrite to carcinogenic N-nitroso compounds in schistosoma-infected bladder.⁷⁻⁹

An unusually high prevalence of bladder cancer was observed by clinicians and the cancer registry of Usman Danfodiyo University Teaching Hospital, Sokoto (personal communication). This study was therefore undertaken to determine the epidemiological characteristics of bladder cancer in the region and to assess the impact of schistosomiasis on these cases.

MATERIALS AND METHODS

Clinical and histopathological records of 133 advanced bladder cancer cases seen at Usman Danfodiyo University Teaching Hospital, Sokoto between January 1999 and December 2004 were reviewed. Only clinically advanced cases presenting with palpable bladder tumours and supported by ultrasonography and cytology or histologically confirmed cases were included. Information obtained included age, sex, occupation, year of presentation, residential address, history of childhood haematuria, ultrasonographic findings and results of cytology and histology.

All the slides showing bladder carcinoma were further reviewed for histological evidence of schistosomiasis. The data obtained was entered into Epi-Info 2002 (Centre for Disease control and Prevention, Atlanta) and analyzed. The records of other histologically and cytologically diagnosed malignancies in 2004 were also obtained from the cancer registry of Usman Danfodiyo University Teaching Hospital.

RESULTS

During the period of study, there were 312 clinically diagnosed cases of bladder cancer but only 133 (42.6%) cases satisfied our criteria for inclusion. There was a 4.7 fold rise in the number of bladder cancer cases with 11 in 1999 and 52 in 2004. Correspondingly, the hospital's patients volume rose 1.8 times, from 62,460 in 1999 to 109,789 in 2004.

![Figure 1: Distribution of patients with Bladder Carcinoma by Age.](image_url)

<table>
<thead>
<tr>
<th>Type of cancer</th>
<th>No.(%) of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Squamous Cell</td>
<td>28 (65.1)</td>
</tr>
<tr>
<td>Transitional</td>
<td>12 (27.9)</td>
</tr>
<tr>
<td>Adenocarcinoma</td>
<td>2 (4.7)</td>
</tr>
<tr>
<td>Signet ring</td>
<td>1 (2.3)</td>
</tr>
<tr>
<td>Total</td>
<td>43 (100)</td>
</tr>
</tbody>
</table>

Table 1: Histological Features of Bladder carcinoma in study patients

of bladder tumour supported by cytological reporting of malignancy. The remaining fifty seven (42.9%) had palpable suprapubic mass confirmed to be arising from the bladder by ultrasound scan. Histopathology register of the hospital revealed that among the 182 diagnosed malignancies in 2004, 36 (19.8%) were bladder cancers. This was the most common diagnosed malignancy in 2004. Histological findings in 43 patients were as depicted on table 1. In half of the cases of squamous cell carcinoma, (SCC) there was histological evidence of chronic schistosomiasis. The histology of one of such cases is shown in Figure 2. Two patients with transitional cell carcinoma (TCC) also had histological evidence of schistosomiasis, Figure 3. Among the SCC cases, 14 (50%) were well differentiated, 12 (42.9%) were moderately differentiated and 2 (7.1%) were poorly differentiated tumours.

DISCUSSION

Our study has revealed that bladder cancer was the most common malignancy in the hospital in 2004. Whilst
the number of cases increased nearly five fold, the hospital attendance only doubled during the same period, suggesting a rising hospital prevalence of bladder cancer. The number that satisfied our inclusion criteria was only a fraction of the actual cases.

The causal relationship between carcinoma of the bladder and schistosomiasis is well documented and has been extensively studied in several parts of the world. The role of schistosomiasis in this multi-step process of bladder carcinogenesis is based on evidence of geographic correlation, age at diagnosis, gender pattern, distinct pathological characteristics, and experimental evidence in infected animals. The clinico pathological pattern of carcinoma of the bladder in several studies from Nigeria also suggest schistosomiasis aetiology.

Our patients came predominantly from rural and agricultural areas of the region known to be endemic for schistosomiasis. The patients were mostly males; with a male to female ratio of 11.1:1 being higher than reported ratios from other Nigerian centres. The male to female ratio in Egypt is 4:1. The male preponderance in Northern Western Nigeria may be related to the more intense exposure in males who are the main agricultural workforce. The age range is in conformity with age pattern seen in schistosomiasis endemic regions.

The histological types were mostly differentiated SCC with histological evidence of chronic schistosomiasis in 50% of SCC cases. Two cases of TCC also showed schistosomal granulomata. All the above features suggest schistosomal contribution in the aetiology of bladder cancer in this region.

In conclusion, this study reveals an association between chronic urinary schistosomiasis and carcinoma of the bladder in this region. The hospital prevalence of this malignancy shows a rising trend.

REFERENCES


