Analysis of Known Risk Factors for Bladder Cancer in Pakistani Population

Pages with reference to book, From 41 To 42

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Introduction

The association between environmental agent that could cause the development of a malignancy was first described by Percival Pott in 1775 who reported scrotal cancer in chemney sweeps[1]. Several carcinogenic agents causing bladder cancer both occupational and non-occupational are well recognised. The incidence of bladder cancer attributed to occupational exposure is between 8% and 20%[2]. The most common occupational carcinogens are 2- naphthylaniine, benzidine, aminobiphenyl, dichlorobenzidine, orthodianisidin orthotolidine, phenacetin, chiornaphazine and cyclophosphamide[2-4]. Epidemiologic studies by Case and co-workers showed that the mean latent period may be as long as 40 to 50 years, however, time period may be diminished in patients who have higher exposure to carcinogens[5]. Mean latent period for tumours in the rubber and chemical industry was 25 years. Factors recognised as non-occupational carcinogens include tobacco[6], excessive exposure to motor vehicle exhaust fumes[2] chronic urinary tract infection[7], schistosomiasis[8], saccharine[9], coffee[10] and drugs[11,12]. Both retrospective and prospective studies have shown that there is an increased risk of developing bladder cancer in cigarette smokers[1,8,13]. This stud has analysed these risk factors in patients with bladder cancer in local population. This evaluation is important since bladder cancer ranks 10th amongst the commonest malignancies in males in Pakistan and is on top of the list of urological malignancies[14].

Patients and Methods

The study is based on data collected from 250 consecutive patients of carcinoma of urinary bladder admitted in the Sindh Institute of Urology and Transplantation, Dow Medical College, Karachi, between 1988-1991. Diagnostic criteria and assessment included detailed clinical history, clinical examination, laboratory investigations, intravenous urography, ultrasound, exfoliative urinary cytology, CT scan (where indicated), cystoscopy and biopsy. Final diagnosis was established after histopathological examination of biopsied tissue. Thereafter a detailed history of known etiological factors was documented on a proforma to include the following occupational and non- occupational risk factors. Occupational factors include chemicals like petroleum products (plant processing petroleum products), dyes like benzicline compounds used in textile printing, tailoring and hairdyes used by hairdressors and rubberarticle containing Bnephthylamine. Non-occupational factors include cigarette smoking, drugs like phanacetin, cyclophosphamids and chiornaphazin and chronic infection/infestation of bladder.

Results

Of the 250 cases, 203 were males and 47 females with a male to female ratio of 4.3:1. Age distribution ranged from 14 to 81 years and peak age group was between 51 to 60 years. Etiological factors were evaluated in each patient (Table I).

Table I. Environmental factors for bladder cancer.

Occupations	Incriminated chemical agents	No.	%
A. Occupational			
I. Chemicals			
Petrol pump workers	Petrochemical compounds	11	4.4
Sui gas workers	Natural gas	2	0.8
II. Dyes			
Textile printing	Benzidine compound	7	2.9
Tailoring	Benzidine compound	6	2.4
Leather works	Benzidine compound	4	1.6
Hair dressing	Benzidine compound	1	0.4
III Rubber articles			
Rubber industry	β -naphthylamine	3	1.2
B. Non-Occupational			
Cigarette smoking		170	68

Thirty-four (13.6%) had established occupational and 170 (68%) non- occupational factors. In the occupational group 7.1% cases had exposure to benzidine compounds like textile printing, tailoring and hair dressing. Thirteen (5.1%) patients were exposed to petrochemical compounds and natural gas. Three patients had long history of exposure to beta-naphthylamine in rubber industry. The duration of exposure varied from 3 to 15 years with an average duration of 12 years. Majority of patients (68%) had one non- occupational factor, i.e., smoking (Table I) while no other factor was recognised. The numbcrofcigarcttes smokcdperday varied from 15 to 90, the average being 23 cigarettes per day. Sixty percent of patients smoked upto 20 cigarettes per day while 12.2% were heavy smokers,i.e., more than 30 cigarettes per day (Table II).

Table II. Number of cigarettes smoked in non-occupational group.

No. of cigarettes/day	No. of patients	% of total cases
<10	37	21.7
11-20	65	38.2
21-30	47	27.6
31-40	16	9.4
41-50	3	1.7
>50	2	1.1

The duration of smoking ranged between 5 to 55 years, the average being 26 years. Majority (88.2%) of patients smoked for 10 to 40 years and small number (4.7%) for more than 40 years (Table III).

Table III. Duration of smoking in years in non-occupational group.

Duration in years	No. of patients	% of total cases
<10	14	8.2
10-20	54	31.7
21-30	65	38.2
31-40	31	18.2
41-50	4	2.3
>50	4	2.3

Of the 80 patients with bladder cancer who were non-smokers, only 20(25%) had high risk occupations.

Discussion

Historically in 1885 bladder cancer was the first tumour identified where an association was established between chemicals exposure and development of cancer[15]. Since then several chemicals used in various industries appeared as causative factors of bladder cancer. Thus 8-20% of the bladder cancer were attributed to be caused by exposure to chemicals[2,16], while persuing occupations in gas, petrochemical industry, rubber industiy, dyeing and textile industries, leather works and tailoring, etc. In these studies the frequency of such occupational bladder cancer varied between geographical regions, depending upon the type and concentration within an area of chemical industries. Our data of 13.6% of bladder cancer where occupational association was identified corroborates with Western reports. Since in the Western reports exposure period varied from 5 to 25 years, the urothelial cancer of today represents the working practices of 25 years ago, the same may apply to our patients. With the advent of the development of chemical industries in Pakistan. we need a candid view specially of industries using high risk chemicals.

Cigarette smoking has been identified as an important risk factor for bladder cancer and the cause and effect relationship hasbeenidentifiedby several studies[17-19]. Various measures have been used to assess the magnitude of the relationship between smoking and bladder cancer, i.e., number of cigarettes smoked and duration of cigarette smoking[7,20]. Ourdata supports the contentions that cigarette smoking is the most consistent finding in the epidemiological studies of bladder cancer. In 60 patients no known factors could be identified. This group which constitutes 24% of our patients needs further evaluation for possible etiological factors prevalent locally. This initial study highlights the need for a more detailed multi-centre study to identify etiological factors for bladder cancer in Pakistan.

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