

RESEARCH COMMUNICATION

Urinary Bladder Carcinoma and Human Papilloma Virus Infection, an Appraisal of Risk

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Abstract

Human papilloma virus (HPV) is a well known risk factor for cancer development in different body sites, involved in the pathogenesis of several intraepithelial lesions and cancers, for example of the upper alimentary and respiratory tracts and cervix. Urinary bladder carcinoma is a common urological malignancy for which a relationship with human HPV has been indicated, but the results are controversial. Here, the author performed an appraisal of the previous reports on the studies to document correlation between HPV infection, defined as DNA positive, and urinary bladder carcinoma. According to the literature review, 5 reports were recruited for metanalysis, including 239 cases and 52 healthy subjects. The overall HPV DNA positive rates for the patients and healthy control subjects were 25.5 % (61/239) and 11.5 % (6/52), respectively, the odds ratio of 2.6 pointing to potential as a risk factor.

Key Words: Urinary bladder carcinoma - HPV DNA

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Introduction

Human papilloma virus (HPV) has been demonstrated to be involved in the pathogenesis of several intraepithelial lesions and cancers (Spano et al., 2005), with DNA integration in intraepithelial and invasive anogenital lesions (Spano et al., 2005; Moodley, 2005). The expression of human papilloma virus oncogenes results in chromosomal aneuploidy, favouring the integration of high-risk human papillomavirus genomes into cellular chromosomes (Moodley, 2005). HPV infections seem to be strongly associated with several neoplasms, including head and neck, oral, cervical, anal, vulvar, vaginal cancers and probably some lung cancers (Spano et al., 2005).

It has been suggested that infection with HPV may also be an important factor in the development of bladder cancer (Boucher and Anderson, 1997) and studies have been performed using various techniques of molecular biology to assess this possibility. However, the results are inconsistent. Here, the author performed an appraisal of reports in the literature to test the hypothesis that HPV infection might contribute to urinary bladder cancer.

Materials and Methods

A literature review to find the previous reports on the studies to document correlation between HPV infection and urinary bladder carcinoma was performed. The operative

definition for HPV infection in this study is HPV DNA positive in histological specimens by PCR. The author used this definition because HPV infection defined by other criteria is not reliable (Smetana et al., 1995). The author used the electronic search engine PubMed (www.pubmed.com) in searching the literature. Included were any studies that presented prevalence of HPV DNA in both patients with urinary bladder carcinoma and non cancerous control subjects. The available reports were collected and extracted for data on prevalence of HPV DNA which were then used for further metanalysis study in which the overall antibody positive rate in the patients and healthy subjects as well as the odds ratio were calculated using SPSS 11.0 for Windows.

Results

According to the literature review, 5 reports (Ludwig et al., 1996; Tekin et al., 1999; Noel et al., 1994; Agliano et al., 1994; Yu et al., 1993) were recruited for metanalysis (Table 1), with a total of, 239 cases and 52 healthy subjects. The overall HPV DNA positive rates were 25.5 % (61/239) and 11.5 % (6/52), respectively, giving an odds ratio of 2.6 (Table 2).

Discussion

Sengupta et al estimate that bladder cancer is the fifth

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Table 1. Reports on HPV DNA in the Patients with Urinary Bladder Carcinoma and Non Cancerous Control Subjects

Reports	Patients with urinary bladder carcinoma		Non cancerous control subjects	
	Total (N)	HPV DNA positive N (%)	Total (N)	HPV DNA positive N (%)
Ludwig et al, 1996 [5]	23	6 (26.1)	9	6 (66.7)
Tekin et al, 1999 [6]	42	2 (4.8)	10	0 (0)
Noel et al, 1994 [7]	75	2 (2.7)	15	0, 0 %
Agliano et al, 1994 [8]	46	23 (50.0)	10	0, 0 %
Yu et al, 1993 [9]	53	28 (52.8)	8	0, 0 %

Table 2. Case-control Analysis for the Correlation between HPV DNA and Urinary Bladder Carcinoma

HPV DNA by PCR	Patients with urinary bladder carcinoma	Non cancerous control subjects
Positive	61	6
Negative	178	46

most common malignancy in Europe and the fourth most common malignancy in the United States (Sengupta et al., 2004). Relationships with HPV have been indicated (Boucher and Anderson, 1997; Lopez-Beltran and Escudero, 1997), with different rates for six virus types in inverted papilloma and papillary transitional cell carcinoma of the bladder (Chan et al., 1997). Although there are many reports on the correlative study between HPV infection and urinary bladder carcinoma most focused on only the patient group. Therefore, implications for risk could not be set.

Here, summary of previous reports adequate to determine correlation between HPV infection and urinary bladder carcinoma and metanalysis provided evidence that the presence of HPV DNA is a risk factor for urinary bladder carcinoma.

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