

# Major variation in bladder cancer subtype trends highlights need for focused research

January 4 2012

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Researchers are being urged to differentiate between two types of bladder cancer when they carry out studies, after a detailed trends analysis revealed significant differences between the main subtypes of the disease.

A major study of nearly 128,000 American [bladder cancer](#) cases, published in the January edition of the urology journal *BJUI*, shows that bladder [cancer rates](#) showed a 9% overall decrease between 1973 and 2007.

However, when the researchers looked at the two main subtypes, which accounted for 94% of the bladder tumours, they found that papillary transitional cell carcinoma (PTCC) increased by 56% over that period and non-papillary transitional cell carcinoma (NPTCC) fell by 53%.

"These two subtypes of bladder cancer are normally categorised as a single disease called transitional cell carcinoma in research studies, but our findings highlight major trend differences over more than three decades" says lead author Dr Yawei Zhang, from the School of Public Health and School of Medicine at Yale University, USA.

"This is a significant finding that underlines the importance of future research differentiating between these two subtypes."

Bladder cancer is the fifth most common cancer in the USA and is responsible for approximately 70,000 new cases and 15,000 deaths a

year. Cigarette smoking and [occupational exposure](#) to arylamines – organic chemicals – is thought to account for more than half of the cases in the USA.

The research team used the National Cancer Institute's Surveillance and Epidemiology and End Results data for 1973-2007 to analyse trends in bladder cancer by subtype, disease stage and grade. This revealed the different trends between papillary tumours, that grow on the outside surface of the bladder, and non-papillary tumours, that grow on the inside of the bladder.

Key findings of the study included:

- The statistics covered 127,614 first primary bladder cancer cases. The majority of the patients (74%) were male and white (92%). Nearly two-thirds of the tumours (65%) were PTCC and 29% were TCC. The other 6% included squamous cell, adenocarcinoma and small cell [carcinoma](#).
- The overall age-adjusted incidence rates for bladder cancer fell by about 9% between 1973 and 2007 from 16.7 per 100,000 to 15.2. Similar trends were noted in both genders and racial groups.
- However, significant differences emerged when the research team looked at the two main subtypes. While the age-adjusted rates for NPTCC fell by about 53%, from 7.9 per 100,000 in 1973 to 3.7 per 100,000 in 2007, PTCC increased by 56% from 6.8 to 10.6 per 100,000 over the same period. Similar trends were noted in both genders and racial groups and in different stages of the disease – localised, regional and distant.
- A dramatic increase in the incidence rates of grade four tumours was found between 1998 and 2007, with decreasing trends for grade one, two and three tumours. This is probably due to

changes in the grading system introduced in 1998, but the lack of reduction in more aggressive bladder cancer is of great concern. Similar increases were observed for NPTCC and PTCC, genders, racial groups and different disease stages.

"The striking differences in the trends between PTCC and NPTCC suggest that they may be two disease entities with different causes" concludes Dr Zhang. "Recent survival analysis has also shown that survival rates are substantially higher for PTCC than NPTCC.

"Despite this, no epidemiological studies have investigated the risk factors of these two subtypes separately. Our study suggests that future research must make clear distinctions between PTCC and NPTCC and not just treat them as subtypes of [transitional cell carcinoma](#)."

**More information:** Changing patterns of bladder cancer in the USA: evidence of heterogeneous disease. Zhang et al. BJUI.109, 52. (January 2012). [doi:10.1111/j.1464-410X.2011.10283.x](https://doi.org/10.1111/j.1464-410X.2011.10283.x)

Provided by Wiley

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