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Detection of bladder transitional cell carcinoma: urinary hTERT assay versus urine cytology

Yahyazadeh SR.[1]
Mehraban D.[1]
Ghaffari SH.[2]*
Alimoghadam K.[2]
Ghavamzadeh A.[2]
Naderi Gh.
Kazemeyni SM.
Rasteh M.

1-Department of Urology, Shariati Hospital
2-Hematology, Oncology and BMT Research Center, Shariati Hospital

Tehran University of Medical Sciences

Corresponding Author:

Ghaffari SH

Abstract:

Background: Transitional Cell Carcinoma (TCC) of bladder is the second most common urogenital malignancy and because of its high rate of recurrence (two third of tumors recur) vigilant surveillance is necessary. There have been a lot of efforts to find a proper biomarker for detecting urothelial cancers because available methods are expensive and invasive (like cystoscopy) or have a low degree of sensitivity (like urine cytology). Urothelial malignancies, like other cancers tend to express a large amount of telomerase. The aim of this study was to evaluate the possible application of voided urine human telomerase reverse transcriptase (hTERT) mRNA assay in detecting low-grade bladder carcinoma in comparison with urine cytology.

Methods: Voided urine samples were collected from 49 patients who were supposed to go under operation. Samples were examined by both Quantitative Real-time RT-PCR (for measuring hTERT mRNA level) and cytology; the results were then compared to the final pathologic studies.

Results: Regardless of clinical stage and or pathological grade of tumor, sensitivity of telomerase test and urine cytology was 74% and 16% respectively. There was a strong correlation between results of urine cytology and stage and/or grade of tumor; however, sensitivity of telomerase test was acceptable regardless of stage and or grade of tumor. There was a statistically significant difference between sensitivity of urine cytology and telomerase test ($p<0.001$).

Conclusion: Detection of hTERT-mRNA can potentially be used as a non-invasive method for diagnosis and follow up of bladder carcinoma instead of urine cytology.

Keywords:

Bladder carcinoma ، transitional cell carcinoma ، telomerase ، urine cytology ، RT-PCR

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