ID 82 - Diagnostic predictive value of the Epicheck Test in the follow up of patients with non muscle invasive bladder cancer (NMIBC)

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OBJECTIVES

Cystoscopy and cytology represent the gold standard for detecting bladder cancer (BC). Cystoscopy is the most efficient method currently available for the detection of papillary and solid tumours, but it is invasive and causes discomfort to the patients. Cytology is highly sensitive in high grade tumours but has poor sensitivity in low grade tumours with only 4-11% Therefore, a urinary marker with a high sensitivity and specificity could be an additional tool in BC monitoring for both, low grade and high grade tumors.

The Bladder Epicheck Test (Nucleix ltd., Rehovot, Israel) is a newly developed urinary marker based on DNA methylation changes associated with BC in a panel of 15 genomic biomarkers.

The aim of our study was to evaluate the diagnostic accuracy of the Bladder Epicheck Test in the follow up of patients with non-muscle-invasive bladder cancer (NMIBC) and to compare it with urinary cytology, cystoscopy and/or histology.

METHODS

243 patients under follow up for NMIBC were included in this prospective study. Samples were analyzed with the Bladder Epicheck Test and urinary cytology. Subsequently to urine collection, the patients underwent cystoscopy and if cystoscopically positive, a transurethral resection of the bladder (TUR-B).

Cytologies were evaluated according to the Paris System of reporting cytology and categorized in negative for high grade urothelial cancer (NHGUC), atypical urothelial cells (AUC), suspicious for high grade urothelial cancer (SHGUC), high grade urothelial cancer (HGUC), low grade urothelial neoplasia (LGUN) and not diagnostic. For the Bladder Epicheck Test a software calculated the EpiScore, a number between 0 and 100 representing the overall methylation level of the sample. If the EpiScore was equal or above 60 was considered positive.

Sensitivity, specificity, positive (PPV) and negative predictive value (NPV) of Bladder Epicheck and cytology were calculated using cystoscopy/histology as gold standard.

RESULTS

Overall sensitivity was 33.3 % for cytology, 62.3% for Bladder Epicheck and 66.7% for the two tests combined. The sensitivity of cytology increased from 7.7% in low grade (LG) to 66.6% in high grade (HG) tumours whereas, for the Bladder Epicheck, the sensitivity was 46.1% in LG and 83.3% in HG tumours. Combined cytology and Bladder Epicheck yielded an overall sensitivity of 56.4% for LG and 90% for HG tumours.

Overall specificity was 98.6% for cytology, 86.3% for Bladder Epicheck and 85.6% for the two tests combined. PPV for cytology was 92% and for Bladder Epicheck 68.2%. For the 2 tests combined it was 68.6%. NPV was similar for the 2 tests: 75.8% for cytology, 82.9% for Bladder Epicheck and 84.5% for the 2 tests combined.

n=215/69Tu	% Cytology	% Epicheck	% Cyto+Epi
Sensitivity	33.3	62.3	66.7
Specificity	98.6	86.3	85.6
PPV	92	68.2	68.6
NPV	75.8	78.6	84.5

Sensitivity according to grade

n= 69	% Cytology	% Epicheck	% Cyto + Epi
Low grade (n= 39)	7.7	46.1	48.7
High grade (n= 30)	66.7	83.3	90

CONCLUSIONS

The sensitivity of Bladder Epicheck was significantly higher than for cytology. The test performed very well in terms of specificity but could not reach the high value of cytology, PPV was higher for Bladder Epicheck, while NPV performed approximately the same for both tests.

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