The prognostic value of cytology and fluorescence in situ hybridization in the follow-up of nonmuscle-invasive bladder cancer after intravesical Bacillus Calmette-Guérin therapy


Molecular markers reliably predicting failure or success of Bacillus Calmette-Guérin (BCG) in the treatment of nonmuscle-invasive urothelial bladder cancer (NMIBC) are lacking. The aim of our study was to evaluate the value of cytology and chromosomal aberrations detected by fluorescence in situ hybridization (FISH) in predicting failure to BCG therapy. Sixty-eight patients with NMIBC were prospectively recruited. Bladder washings collected before and after BCG instillation were analyzed by conventional cytology and by multitarget FISH assay (UroVysion, Abbott/Vysis, Des Plaines, IL) for aberrations of chromosomes 3, 7, 17 and 9p21. Persistent and recurrent bladder cancers were defined as positive events during follow-up. Twenty-six of 68 (38%) NMIBC failed to BCG. Both positive post-BCG cytology and positive post-BCG FISH were significantly associated with failure of BCG (hazard ratio (HR) = 5.1 and HR = 5.6, respectively; p < 0.001 each) when compared to those with negative results. In the subgroup of nondefinitive cytology (all except those with unequivocally positive cytology), FISH was superior to cytology as a marker of relapse (HR = 6.2 and 1.4, respectively). Cytology and FISH in post-BCG bladder washings are highly interrelated and a positive result predicts failure to BCG therapy in patients with NMIBC equally well. FISH is most useful in the diagnostically less certain cytology categories but does not provide additional information in clearly malignant cytology.