Plasma Thymosin-α1 Level as a Potential Biomarker in Urothelial and Renal Cell Carcinoma

Introduction and Objective: To determine the plasma levels of thymosin-α1(TA1) and prothymosin-α proteins (PTMA) in renal cell carcinoma (RCC) or urothelial carcinoma (UC) patients, and explore the potential of these two molecules as biomarkers.
Materials and Methods: Blood samples were collected from 147 consecutive patients, including 97 UC [renal pelvis (n=29), ureter (n=15), and urinary bladder (n=53)] and 50 RCC patients, and from 55 patients with benign diseases. Their clinical characteristics were obtained from medical record review. Plasma TA1 and PTMA levels were measured using enzyme-linked immunosorbent assay and their correlation with tumor grade, pathologic stage, and survival were explored.
Results: Plasma TA1 levels were significantly lower in RCC patients than in UC or benign patients, particularly in UC of the renal pelvis patients ($p<0.0001$). Plasma PTMA levels were also significantly lower in UC patients compared to RCC patients and benign patients ($p<0.05$). Plasma TA1 levels inversely correlated with pathologic stage both in bladder cancer and RCC patients ($p=0.03$ and 0.02, respectively). Both plasma TA1 and PTMA correlated with tumor grade. Plasma TA1was a prognostic indicator for progression-free and disease-specific overall survival ($p=0.008$ and 0.04, respectively).
Conclusions: Plasma TA1 level may be a biomarker for differentiating between UC and RCC. It may also be a prognostic factor for disease progression and disease-specific survival in bladder cancer patients. These findings warrant more studies for validation.