

The biochemical value of urinary metalloproteinases 3 and 9 in diagnosis and prognosis of bladder cancer in Egypt

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Abstract

Background: Matrix metalloproteinases (MMPs) have long been associated with cancer-cell invasion and metastasis.

Few studies are available that describe this association with bladder cancer either related or unrelated to schistosoma infection.

Evaluating the urinary levels of MMP3 and MMP9 as diagnostic and prognostic biomarkers in different stages of schistosomal and non schistosomal bladder cancer was the aim of the present study. Urine samples were collected from 70 patients with schistosomal and non schistosomal bladder cancer at early and advanced stages and also from 12 healthy volunteers as controls. Urinary levels of MMP-3 and MMP-9 was measured by

ELISA technique. Sensitivity and specificity of both markers were determined. Results: Urinary levels of both MMP-3 and MMP-9 were significantly elevated in all bladder cancer patients compared with controls. MMP-3 started to elevate in early stages of schistosomal bladder cancer (0.173 ng/ml) and non-schistosomal bladder cancer patients (0.308 ng/ml) compared to control (0.016 ng/ml) and remained elevated in advanced stages (0.166, 0.235 ng/ml) of both types of bladder cancer patients. In contrast, MMP-9 showed a significant elevation in advanced stages only of both schistosomal and non schistosomal bladder cancer patients (10.33, 21.22 ng/ml) compared to control (0.409 ng/ml) and this elevation of both markers was much higher in non schistosomal bladder cancer.

Both Metalloproteinases were specific for the diagnosis of the disease but MMP-3 was more sensitive and this sensitivity was evident in the early stage (84.85% for MMP3, 27.28% for MMP9). Conclusions: MMP3 may be the recommended urinary metalloproteinases as early diagnostic biomarker in the early stages of both types of bladder cancer although both MMP9 and MMP3 can be used in the diagnosis of advanced stages. Further studies are required on large number of urine samples to confirm these results.

Keywords: Bladder cancer, Schistosoma, MMP3,MMP

