Biomedical Research & Therapy

ISSN: 2198-4093
www.bmrat.org

ORAL

PLASMA LEVELS OF MMPs AND TIMP-1 IN BLADDER CANCER PATIENTS

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Abstract

Background: Urinary bladder cancer (UBC) is a common disease worldwide with high mortality rate [1]. UBC is the ninth most frequently diagnosed cancer worldwide, with highest incidence rates observed in developed countries. About 75% of bladder cancer patients are men [2]. Matrix metalloproteinases (MMPs) and tissue inhibitors of metalloproteinases (TIMPs) are diagnostic tools in oncology, liver diseases, and rheumatoid arthritis, which may prove to be a valuable prognostic tool in clinical setting [3]. The aim of the present study was to assess the prognostic power of plasma MMPs and TIMP-1 in patients with UBC of different stages.

Methods: This study enrolled 29 patients with UBC (27 males, 2 females), aged 52-76 years. Preoperative study for all patients included blood test, blood chemistry, urine analysis, immunogram, computer tomography, tumor biopsy. The spread of cancer was characterized based on TNM clinical classification 7th review (2009). Stage distribution of patients were as following: Stage I – 6 patients; Stage II - 5; Stage III - 7; Stage IV - 8 patients). The control group consisted of 15 healthy individuals (8 females and 22 males; aged 30-35 years). Plasma levels of MMP-1, MMP-2, MMP-3, MMP-8, MMP-9 and TIMP-1 were determined by ELISA before the curative procedure and correlated afterwards with clinical parameters of the patient. Data analysis was conducted using Microsoft Excel 2010.

Results: Plasma levels of MMP-9 were significantly higher (by 1.5-2.0 times) in all patients with UBC compared to controls. Plasma level of MMP-8 in Stage III UBC patients was 1.2 times higher than in control group. The levels of MMP-1 and MMP-2 were increased compared to controls, and their elevation correlated with increase in cancer stage. Plasma level of MMP-3 in patients with bladder cancer Stage I, II and III were higher compared to controls by 1.3, 1.2 and 1.2 times respectively. High plasma levels of TIMP-1 were determined in patients with Stages III and IV, which raises question as to its role and function in advanced stage disease, as it may have a protective role in the mechanism of invasion by inhibiting extracellular matrix degradation.

Conclusion: In patients with urinary bladder cancer the plasma levels of MMP-1, MMP-2, MMP-3, MMP-8, MMP-9 and TIMP-1 are elevated. We demonstrated that elevation pattern of MMP-1, MMP-2 and MMP-9 could serve as potential plasma marker for monitoring the cancer progression.

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Competing interests: The authors declare that no competing interests exist.

Received: 2017-06-14
Accepted: 2017-08-11
Published: 2017-09-05

Biomedical Research & Therapy

ISSN: 2198-4093
www.bmrat.org

Keywords

MMPs, TIMP-1, bladder cance

Funding

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