PROSTATE CANCER AND MATRIXMETALLOPROTIENASE-2

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ABSTRACT
Prostate cancer being a most common type of cancer in men, and second most leading cause of death, draws attention of the clinicians as well as the researchers to eradicate it. Till now there is no specific treatment for the cancer. So it is needed to find out drug for the cancer. Here we focused on the prostate cancer and its treatment by Matrix metalloproteinase-2 as a main cause for the metastasis and finally death of the patients by the prostate cancer.

KEYWORDS: Prostate cancer, MMP-2, ECM, Metastasis, invasion.

INTRODUCTION
Among all types of the cancers, prostate cancer is the most common in men.[1] U.S. National Cancer Institute divided prostate cancer into four different stages after diagnosis. In stage I (small and confined to the prostate gland); stage II (larger but limited to prostate gland); stage III (spreads out of the prostate gland and reaches to nearby tissues); and stage IV (spreads to distant organs and tissues, such as rectum, lymph nodes, bones, lung, etc). When prostate cancer spreads out of the prostate gland and metastasizes to distant parts of the body, it is called advanced prostate cancer.[2] Current standard therapies for the early stages of the prostate cancer are surgery, radiation, and adjuvant hormonal therapy because majority of patients are initially diagnosed with localized prostate cancer ultimately relapse. In case of advance prostate cancer patients there is major risk.[3] With toxicity and lack of specificity, chemotherapy is most widely used in advance stage prostate cancer with unsatisfactory results. So targeted drug delivery for
specific molecules, peptides, proteins, and nucleic acids can be helpful in treatment of the prostate cancer. In this review we focus on the prostate cancer and its treatment especially by the Matrix metalloproteinase-2.

METASTASIS
Prostate cancer needs attention for the active treatment because of clinically relevant disease with significant morbidity and mortality and later stages tough to manage because of supporting tumor microenvironment has a decisive role in controlling prostate cancer growth, invasion and metastasis.[4-7] In case of prostate cancer the metastasis is the commonest scenario leading to death as several studies showed about 85% of men with advanced disease will have metastasis.[8-10] Cancer cells disseminate from the original cancer to neurovascular structures to blood to other tissues through cells in transit or adhere to the capillary endothelium and invade, forming micrometastasis. The extracellular matrix (ECM) degradation takes place due to the zinc containing endopeptidases in their structure, secreted in latent form and later activated and involved in metastasis known as matrix metalloproteinases.[11]

Matrix Metalloproteinase-2
There are several causes of the prostate cancer, while the main is Matrix metalloproteinases upreguration mainly Matrix metalloproteinase-2 (MMP-2). MMP-2 is a member of zinc dependant endopeptidases family, participating in ECM degradation in normal development as well as disease[12-13] and also regarded gelatinases A and studies showed association between MMP-2 expression in the primary tumor and the Gleason score, pathological stage, and as an independent prognostic factor and also have been shown to be involved in the release of growth factors that enhance tumor growth and aggressiveness.[9] The ECM degradation leads to disturbance in interactions between cell and ECM. This disturbance mainly causes the harmful effects like prostate cancer where the cross-signaling between epithelium and stroma is so important[1]. The upregulation of MMP-2 is direct cause of prostate cancer and its aggressiveness.

Present and Future perspective
In prostate cancer treatment it is necessary to understand the molecular biology of tumour. Significant advancement of science and research results in several new therapeutic options with many questions in mind of the clinicians as well as researchers due to complex molecular biology of prostate cancer.[14] Questions are mainly focuses on the mechanism and
treatment of the prostate cancer. There is no specific defined mechanism about not only for prostate cancer even for all types of cancers, but specifically recent studies are suggesting the MMPs imbalance is main cause of the prostate cancer. Several study showed more active/upregulated MMP-2 in advanced stage of prostate cancer. There is need to lower the activity/upregulation of MMP-2 by use of MMP-2 inhibitors. These inhibitors can be natural or synthetic. In other words the imbalance of the MMP-2 and MMP-2 inhibitors caused the prostate cancer.\[^{[15]}\] By balancing MMP-2 as well as its inhibitors can be a treatment of the prostate cancer even in advanced stage also. Unfortunately the researches, clinicians and different organizations working in the field of the cancer have no specific drug or treatment for the prostate cancer because frequent failure of drugs in clinical trials with expenses of money and the time. To eradicate the cancer from the world there is a need to be more specific regarding the cause and mechanism of the specific cancer with the specific drug development. By these specific drug it can be possible even cancer treatment also, since it is incurable disease.

**CONCLUSION**

Previous studies have showed that we are still waiting for drug which can give a complete treatment not only for the prostate cancer but for all types of cancer in primary as well as in advanced stage. So for these we have to work with specificity as cancer and drug molecule.

**REFERENCES**


