Translational Research in Urology

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Editorial

Circulating Tumor Cells as a Novel Prostate Cancer Diagnostic Tool

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HIGHLIGHTS

- The exact discrimination between benign prostatic hyperplasia and prostate cancer is an issue.
- ISET®-CTC Test is a simple blood testing with high sensitivity and specificity for malignant prostate cancer diagnosis.
- Developing CTCs detection methods can improve the accuracy of prostate cancer diagnosis.

ARTICLE INFO

Receive Date: 01 July 2020

Accept Date: 28 July 2020

Avaliable online: 22 August 2020

DOI: 10.22034/TRU.2020.260779.1055

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ABSTRACT

The current screening-test for prostate cancer (PCa) has the weak point of high false negative rate and a low true positive rate. There is an extreme need to a new and accurate testing system. Circulating Tumor Cells (CTCs) as the main liquid biopsy components providean excellent biomarker for early diagnosis of PCa, prognosis, recurrence risk, and treatment efficacy. This tumor cells can get release of tumor and freely circulate in the patient's body fluids and easily are traceable to answer the presence of the tumor more that its stage. The new gifted ISET®-CTC Test is a simple blood test with high sensitivity and specificity for the detection of CTC in PCa. As a novel idea it is a chllengable point nowadays that it needs further studies.

Keywords: Circulating Tumor Cells; Prostate Cancer; Benign Prostatic Hyperplasia

Editoial: Most benign PCa are hidden, never designed to progress or affect the patients' life and benign prostatic hyperplasia (BPH) has similar symptoms to malignant ones. Usual PCa screening tests often lead to unnecessary invasive biopsies and over-diagnosis and overtreatment that cause significant harm to patients and therefore a significant waste in healthcare resources. In spite of several weak points of Prostate-specific antigen (PSA), its partial specificity and the high rate of overdiagnosis, it still remains as the most usual test for PCa diagnosis. Several strategies are recruited to improve the diagnostic tests in order to reducing the number of unnecessary biopsies and providing information related to the aggressiveness of the tumor like developed MRI (mpMRI, bpMRI), new biomarkers like PCA3 score, PSA glycoforms, *TMPRSS2:ERG* fusion gene, microRNAs, and androgen receptor variants (1).

For the first time in 1869 the evidence of tumor cells in blood of malignant patient was provided by the pathologist Thomas Ashworth and now after about one and half century we now they are circulating tumor cells (CTCs) as the main liquid biopsy material (2). Very recently, it

has been suggested that new blood test targeting CTCs for PCa are highly-accurate and can improve the decisions in urology in order to avoids invasive biopsies (3). Actually, new PCa test ISET®-CTC have the potential to detect early cancer cells (CTCs) which are releasing from primary solid tumor and entered the bloodstream prior to spreading around the body (4). The cytology-based ISET®-CTC-test can separate cancer cells from benign cells, using the same cytological criteria as used in routine cancer diagnostics, including anisonucleosis, enlarged nuclei, high nuclear-cytoplasmic-ratio, and irregular nuclear borders (5, 6). It is assumed that more accurate PCa detection test will be available by real time tracking of intact living PCa cells in the patient's blood, rather than the PSA protein. Based on the study published in "*Journal of Urology*", the presence of CTCs in pre-biopsy blood samples have been introduced as a diagnosis biomarker for aggressive prostate cancer in 98 pre-biopsy patients and 155 newly diagnosed PCa patients (3).

Moreover, CTCs can consider after treatment to evaluate treatment efficacy and predict the possibility of recurrence (7). It is shown that when the CTC tests were combined with the current PSA test, the prediction of aggressive PCa in subsequent biopsies will be possible with over 90% accuracy. Moreover, the number and type of CTCs can be the indicative of the tumor stage and lead to omit over-treatment and unnecessary biopsies for benign and non-aggressive PCa.

Accordingly, CTCs analysisis efficient, non-invasive and potentially accurate test for PCa. By combining the new CTCs analysis with the current PSA test, we are able to detect PCa with the highest level of accuracy ever seen in any biomarker test, which could spare many patients unnecessary biopsies.

Authors' contributions

FK was responsible for study conception and design, FK wrote the manuscript and provided data, MH supervised the process and edited the manuscript. All authors reviewed the results and approved the final version of the manuscript.

Acknowledgments

Special thanks to Dalla Lana School of Public Health, University of Toronto.

Conflict of interest

All authors declare there is not any conflict of interest for this publication.

Funding

The authors received no financial support for this research.

Ethical statement

Not applicable.

Data availability

Not applicable.

Abbreviations

BPH	Benign prostatic hyperplasia
CTCs	Circulating tumor cells
PCa	Prostate cancer
PSA	Prostate specific antigens

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How to cite this article
Khatami F, Hassanzad M, Circulating Tumor Cells as a Novel Prostate Cancer Diagnostic Tool. Translational Research in Urology. 2020 Jul;2(3):93-95.
DOI: 10.22034/tru.2020.260779.1055
URL: http://www.transresurology.com/article_120191.html