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Review Article

High Levels of the PSA (Prostate Specific Antigen) in Patients with Benign Prostatic Hyperplasia, Chronic Prostatitis and Prostate Cancer

Rishu Bansal [1*]

[1] European University, Tbilisi, Georgia

Corresponding Author: Rishu Bansal, European University, Tbilisi, Georgia, Tel: +91- 9518438131; Fax: +91-9518438131; E-mail: drrishu27@gmail.com

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Abstract

PSA (Prostate specific antigen) belongs to Kallikrein gene family located on long arm of chromosome 19 produced from the prostate glandular epithelial cells, is one of the important diagnostic and prognostic tool for identifying several major conditions such as Benign Prostatic Hyperplasia, Prostatitis and Prostate Adeno-Carcinoma and in many non-cancerous conditions. It has various isoforms such as Pro PSA, BPSA, and IPSA. On performing studies and examining 100-200ml serum between fPSA versus propsA in Biopsy +/- individuals it was found that 25-95% of proPSA in the serum than 9-19% of Fpsa and ProPSA is considered one of the important diagnostic markers for the detection of cancer. we also classify PSA levels on the basis of several factors like PSA Velocity and Density. Subclinical Inflammation can cause elevation in PSA levels, thus inflammation is the characteristic finding in every set of Biopsy which is observed by the pathologist even in the absence of symptomatic prostatitis.At National Centre of Urology in Tbilisi,Georgia 80 Patients has been examined for different conditions mentioned as BPH, chronic and granulomatosus prostatitis ,Prostate Adeno-Carcinoma via two grading system Gleason Gradation and ISUP and our findings were based on PSA levels without total fPSA volume for different conditions.The aim is to identify the PSA levels timely for early diagnosis of the prostate cancer and its importance in clinical and subclinical cases. Significance of the proposal is to evaluate the level of PSA in BPH, prostatitis and prostate cancer.

Keywords: *BPH, Prostatitis, Prostatic Cancer, PSA Levels, ISUP*

Introduction

PSA (prostate specific antigen) is one of the oncological markers in Prostate cancer and use in the diagnosis and prognosis in conditions such as BPH (benign prostatic hyperplasia) and prostatitis. It is secreted from the columnar epithelium of the prostate. PSA belongs to kallikrein related gene family located at locus q13.2-q13.4 on long arm of the chromosome 19. Variations in the levels of PSA have been seen in both cancerous and non-cancerous conditions such as BPH, Prostate cancer, chronic and granulomatosis prostatitis, age related increment and also among some bike riders. biopsies and surgeries may elevate PSA levels. Prostate cancer is leading causes of cancer death in 24 countries ranking 8 globally. It's most common in Australian men and 2nd most common cause of mortality Each year 3300 men dies of Prostate cancer. PSA has its 3 isoforms known as fPSA (free), BPSA and iPSA Studies has been performed in 5 Biopsy positive individuals by taking 100-200 ml of serum and it was found that 25-95% of proPSA than 9-19% of fPSA. (millar, 2001). Along with fPSA other factors PSAD (cutoff value of 0.15) and PSAV (cutoff value of 0.75) might be helpful in assessing prostate cancer with serum levels of 4-10ng/ml. (Lee SC, 2004). In population based studies of Shanghai,China we have seen T to C substitution in gene CYP17 and resulted in increased expression of this gene due to variation because enzyme P450c17α is associated with the biosynthesis of androgens and androgen plays a very important role in prostate growth in BPH and prostate cancer (M.Patricia Madigon, 2003).

Objectives

High levels of PSA in BPH (benign prostatic hyperplasia), prostate cancer, chronic and granulomatous prostatitis. We are taking prostatitis under consideration because it may or may not be associated with BPH, Prostate cancer or prostate disease. Prostatitis group is decided on the basis of extent, tissue or inflammatory cell types involved. Proliferation of inflammation with markers have been seen via radiolabelled thy midine by Immunohistochemical staining (J.C. NICKEL, 2001).

Materials and Methods

In our research we examined 100 patients at National Centre of Urology Histopathological Department in Tbilisi,Georgia using gleason's gradation system.we divided patients into 3 groups classified as BPH(benign prostatic hyperplasia) in group 1,chronic granulomatous prostatitis in group 2 and prostate adenocarcinoma with different grades in group 3.Pathologists and urologist examines PSA levels on the basis of Gleason's score 2-10 and ISUP induced modification to Gleason's grading system. In Gleason's score 2-10. According to Gleason's original 1-5 grading pattern which was created by Donald F.Gleason in 1966 denotes grade 1-3 as tumors indicating normal prostate gland whereas 4-5 as abnormal pattern gland (Rodolfo Montironi, 2010).

MRI (magnetic resonance imaging) and targeted biopsies shows more accurate diagnosis than systemic biopsies but Georgian people prefer 1st Biopsy then MRI because MRI is very costly but individuals in developed Countries can afford MRI 1st and then Biopsy in increased PSA levels.

Goal of the Study: The aim of the study to identify high levels of PSA in different conditions such as BPH, prostatitis etc. for the early identification of prostate cancer.

For identifying diseased condition along with PSA isoforms look for other biomarkers, enzymes involved in biosynthesis of androgens and various inflammatory mediators which can be beneficial in diagnosis and prognosis.

Significance for the Proposal: Studies found out in individuals of age 50-70 has active disease because of normal hormonal levels but person of >75 is not hormonally active as a result of age-related decline in androgens.914 volunteers of age 50 or more with PSA levels 2.5ng/ml or >4ng/ml who had benign prostate examination and 36% of whom underwent biopsy. cancer was detected in 22% individuals with biopsies and 10% are found with low grade and low volume tumors. All the tumors were restricted to its place clinically (William J. Catalona & Deborah S.Smith, 1997). Researchers has examined in screening of 148 men that inflammation, effects of prostate volume affects PSA levels. Majority of cancer generally found in peripheral zone of the prostate.

High PSA levels are found with larger prostates. Acute and chronic inflammation were more prevalent in high PSA groups hence it's concluded that in determining serum PSA levels in men prostate volume and inflammation are very beneficial factors without having clinically significant prostate cancer (Robert B.Nadler, 1995).

Results

After our examination we found out different PSA levels in different cases like in 30 patients with BPH (benign prostatic hyperplasia) had PSA level 4.5-17ng/ml,14 patients with Chronic granulomatous prostatitis had 10-70 ng/ml and in 36 patients with Prostate adenocarcinoma had 2.9-250 ng/ml. All these patients were in age group between 55-78 years.

Conclusion

According to the results that have been taken from the biopsies in each category of diseases need different management. We will continue our research in patients with BPH, prostatitis and prostate cancer for evaluating the spectrum of PSA level for further research material, study and investigations.

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