

Role of Antibiotics in Raised Serum Prostate Specific Antigen (PSA) Level in KPK

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ABSTRACT

Objective: To study the Role of antibiotics in raised serum prostate specific antigen (PSA) Level in Pakistan.

Study Design: Prospective study

Place and Duration of Study: This study was conducted at the Urology Department Ayub Teaching Hospital Abbottabad, Idris Teaching Hospital Sialkot during Feb, 2019 to Feb, 2020.

Materials and Methods: Total 100 male patients with serum PSA level between 4ng/ml to 10ng/ml were enrolled in this study. Patient ages were 50 to 80 years. Detailed history including Diabetes Mellitus & hypertension, physical examination including height (m) weight (kg) blood pressure, fasting & random blood sugar readings & digital rectal examination (DRE) will be performed after taking informed written consent. Patients with positive transrectal Ultrasonography (TRUS) guided biopsy for carcinoma prostate & patients with urinary retention assessed on Ultrasonography (having more than 400ml urine in the bladder) and need catheterization to relieve the urinary retention were excluded. Urine was collected for routine examination, culture & sensitivity (C/S) after prostatic massage. The sample for serum prostate serum antigen (PSA) was collected before digital rectal examination (DRE) and was analyzed by enzyme-linked immune sorbent assay (ELISA) technique. Tablet ciprofloxacin 500 mg I per oral at interval of 12 hours was given for four weeks. Serum prostate serum antigen (PSA) was repeated after completion of four weeks of antibiotic therapy.

Statistics software SPSS-16 was used for data analysis. Mean & standard deviation was computed for quantitative variable i.e. age and serum PSA level pre and post treatment. Mean change in PSA level after the treatment was described in terms of percentage also. Paired samples T test was applied to see the statistic significance of any difference between pre and post treatment PSA levels. Outcome variable i.e. change in PSA was stratified among age to know the effect modification.

Results: One hundred patients presenting with mild Lower urinary tract symptoms (LUTS) and prostate serum antigen (PSA) level between 4-10 ng/ml took part in the study. After a 4 week antibiotic administration serum PSA level were re-assessed. Mean standard deviation, minimum and maximum values of the variables i.e. age, International Prostate Symptom Score (IPSS), pre and post treatment PSA levels, as well as change in PSA after the treatment presented in the table no 1

Mean change in serum PSA level after the treatment was 3.82 which show a 46.58% improvement. Paired samples t test was used to identify the significance of any difference between the pre and post treatment serum PSA levels. P-value =0.001 i.e. showing a statistically significant difference after the treatment as shown in table no 2

39 (39%) patients had their post treatment (Rx) PSA improved in the range of 1-3 whereas 61(61%) patients had an improvement in PSA in the range of 4-7 after the treatment.

Conclusion: Antibiotic treatment is clinically beneficial in patients with high prostate serum antigen levels. Prostate serum antigen reduction or normalization after medical treatment, either antibiotic and/or non steroid anti inflammatory drugs, for ≥ 2 weeks can avoid unnecessary prostate treatment. Antibiotic treatment is more beneficial when the prostate serum antigen level is < 20 ng/mL, especially when the evidence for inflammation is not overt.

Key Words: Antibiotics, Serum, Prostate Specific Antigen (PSA)

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INTRODUCTION

In routine, some expert in urology often Write antibiotics before prostate specimen taken to male with a newly increased prostate serum antigen to decrease inflammation-induced prostate serum antigen raised and help to reduce unnecessary treatment.

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However, others have noted that antibiotic treatment has no significant effect on the prostate serum antigen level and that a lowered level of prostate serum antigen after antibiotic treatment does not mean a decreased danger of prostate cancer¹.

Prostate treatment is a potentially unhealthy procedure. Inflammation of Prostate is commonly reported on needle specimen taken & sixty five percent to seventy percent of sick persons with abnormal prostate serum antigen levels do not have cancer on prostate needle specimen taken. After a two-year clinical and biochemical follow-up of symptomatic male who had a high prostate serum antigen level and a normal direct recording electronic, and normal repeat prostate serum antigen level, Prostate treatment can be safely avoided². In the present observational we aimed to address the controversy of whether antibiotic treatment can exclude inflammation in the differential diagnosis of prostate serum antigen raised and thus can avoid unnecessary Prostate treatment. We considered sick persons with LUTS, normal direct recording electronic and normal urine analysis, and elevated prostate serum antigen levels.³

MATERIALS AND METHODS

This prospective case series study will be carried out for 6 months in Urology Department Ayub teaching Hospital Abbottabad and Idris Teaching Hospital Sialkot. Total 100 male patients with serum PSA level between 4ng/ml to 10ng/ml were enrolled in this study. Patient ages were 50 to 80 years. Detailed history including Diabetes Mellitus & hypertension, physical examination including height (m²) weight (kg) blood pressure, fasting & random blood sugar readings & digital rectal examination (DRE) will be performed after taking informed written consent. Patients will positive transrectal Ultrasonography (TRUS) guided biopsy for carcinoma prostate & patients with urinary retention assessed on Ultrasonography (having more than 400ml urine in the bladder) and need catheterization to relieve the urinary retention were excluded.

Urine will be collected for routine examination, culture & sensitivity (C/S) after prostatic massage. The sample for serum PSA will be collected before digital rectal examination (DRE) and will be analyzed by ELISA technique. Tablet ciprofloxacin 500 mg I per oral at interval of 12 hours will be given for four weeks. Serum PSA will be repeated after completion of four weeks of antibiotic therapy.

Statistics software SPSS-16 will be used for data analysis. Mean & standard deviation will be computed for quantitative variable i.e. age and serum PSA level pre and post treatment. mean change in PSA level after the treatment will be described in terms of percentage also. Paired samples ttest will be applied to see the statistic significance of any difference between pre and

post treatment PSA levels. Outcome variable i.e. change in PSA will be stratified among age to know the effect modification.

Inclusion criteria: All the sick persons on antibiotic therapy in sick persons with high prostate serum antigen levels.

Exclusion criteria: All the sick persons with high prostate serum antigen levels without written antibiotic therapy.

Data extraction and analysis: The objectives were to study the effectiveness and safety of using antibiotic therapy in prostate serum antigen reduction resulting in the avoidance of unnecessary prostate treatment. The variables extracted from each study were: patient demographics, antibiotic type, antibiotic duration, non Steroidal anti-inflammatory drug use with antibiotic or not, prostate serum antigen reduction level after antibiotic therapy, and rate of prostate treatment after antibiotic treatment.

RESULTS

One hundred patients presenting with mild Lower urinary tract symptoms (LUTS) and serum prostate serum antigen (PSA) level between 4-10 ng/ml took part in the study. After a 4 week antibiotic administration serum PSA level were re-assessed. Mean standard deviation, minimum and maximum values of the variables i.e. age, IPSS, pre and post treatment PSA levels, as well as change in PSA after the treatment presented in the table no 1.

Table No.1: Age & Characteristics distribution Role of antibiotics in raised serum prostate specific antigen (PSA) Level in Pakistan

Characterizes	Frequency No.	%age
Age		
51 to 70 years	55	55
71 to 80 years	45	45
Co-morbidities		
Obesity	56	56
Hypertension	59	59
Diabetes Mellitus	52	52

Table No.2: Mean, standard deviation, minimum and maximum values of the variables; age, IPSS, pre treatment (Rx PSA), PSA, Post treatment (Rx PSA) PSA, and Change in PSA

	Min.	Max.	Mean	Std. Deviation
Age	56	80	68.98	8.213
IPSS	4	7	5.84	.861
Pre Rx PSA	5	10	8.20	1.589
Post Rx PSA	2	7	4.39	1.127
Change in PSA	1	7	3.82	1.306

Mean change in serum PSA level after the treatment was 3.82 which show a 46.58% improvement. Paired

samples t test was used to identify the significance of any difference between the pre and post treatment serum PSA levels. P-value =0.001 i.e. showing a statistically significant difference after the treatment as shown in table no 2

39 (39%) patients had their post treatment (Rx) PSA improved in the range of 1-3 whereas 61(61%) patients had an improvement in PSA in the range of 4-7 after the treatment

DISCUSSION

Although there is disagreement surrounding the value of antibiotics in reducing higher prostate serum antigen levels, some expert of urology in routine often prescribe antibiotics before prostate treatment to male with a newly increased prostate serum antigen level. Prostate serum antigen level reduction after antibiotics might identify those patients in whom prostate treatment can be avoided.

Some researchers have found that antibiotic treatment can decrease inflammation-induced prostate serum antigen raised and help to reduce unnecessary prostate treatment. Conversely, others have noted that antibiotic treatment has no significant effect on the prostate serum antigen level, and a lowered prostate serum antigen level after antibiotic treatment does not mean a decreased risk of prostate tumor¹.

The antibiotic can be written for two to four weeks⁸ or six to eight weeks^{4,7}. The type of antibiotic used is based on local reactivates and quinolones are the most frequently used type.

The observation for inflammation should be noted before giving antibiotic treatment in sick persons with high prostate serum antigen levels. The proof of inflammation can be delineated via earnings per share⁷, symptoms of acute or chronic inflammation of prostate^{4,7,9,17}, and observation of the degree of inflammation after prostate surgery⁹.

The prostate serum antigen level in focus for antibiotic treatment ranges from four to ten ng/mL. Some studies founded prostate serum antigen levels <four ng/mL^{6,17}, whilst others founded levels >ten ng/mL^{9,16}. In sick persons with prostate serum antigen levels higher than the threshold value, definitive treatment should be not postponed for primary antibiotic treatment.

After use of antibiotic treatment, the prostate serum antigen level was normal by a mostly of percentages, ranging from sixteen percent to fifty nine percent^{6-8,10}. Furthermore, the range of the prostate serum antigen level decrease was Seventeen to eighty percent^{4,13,15,17} or a less than twenty percent decrease from baseline¹⁷.

The f/t prostate serum antigen ratio rather than prostate serum antigen appears to be more helpful in suggesting prostate tumor in cases taking antibiotic treatment for high prostate serum antigen levels¹².

Prostate treatment should be considered without giving antibiotic treatment in sick persons with high prostate

serum antigen values, if a suspicion of inflammation of prostate does not exist¹⁷.

The rate of tumor detection after receiving antibiotic treatment varied from two percent to twenty nine percent^{4,6,7,10-13,17}.

Carcinoma was found in forty to fifty two percent of sick persons who did not have a prostate serum antigen decrease. Conversely, a detection rate of seven point seven to twenty point three percent was found in sick persons who had a prostate serum antigen decrease in comparison with the pre-treatment values^{10,17}.

In the literature of pathological results after antibiotic treatment, prostate tumor was evident in only twenty point nine percent to twenty five point five percent, whilst chronic inflammation and BPH was found in fifty point seven to seventy four percent and four point seven to twenty one point eight percent, respectively⁴.

For specific prostate serum antigen values, prostate cancer was detected in Twelve percent (three of twenty five sick persons) with prostate serum antigen levels of less than two point five ng/mL, twelve point seven percent (six of forty seven sick persons) with prostate serum antigen levels of \geq two point five – < four ng/mL, and in thirty percent (21/70sick persons) with prostate serum antigen levels \geq four ng/mL⁴. While, the cancer detection rate in patients having a prostate serum antigen level between four to ten ng/mL was ten point eight to twelve percent¹⁰.

CONCLUSION

Antibiotic treatment is clinically beneficial in patients with high prostate serum antigen levels. Prostate serum antigen reduction or normalization after medical treatment, either antibiotic and/or non steroid anti inflammatory drugs, for ≥ 2 weeks can avoid unnecessary prostate treatment. Antibiotic treatment is more beneficial when the prostate serum antigen level is <20 ng/mL, especially when the evidence for inflammation is not overt.

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Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Liu J, Hu WL. Can antibiotic treatment exclude inflammation in the differential diagnosis of

- elevated PSA? Article in Chinese. *Zhonghua Nan Ke Xue* 2012;18:747–750.
2. Erol H, Beder N, Caliřkan T, et al. Can the effect of antibiotherapy and anti-inflammatory therapy on serum PSA levels discriminate between benign and malign prostatic pathologies? *Urol Int* 2006;76:20–26.
 3. Heldwein FL, Teloken PE, Hartmann AA, et al. Antibiotics and observation have a similar impact on asymptomatic patients with a raised PSA. *BJU Int* 2011;107:1576–1581.
 4. Lee AG, Choi YH, Cho SY, et al. A prospective study of reducing unnecessary prostate biopsy in patients with high serum prostate-specific antigen with consideration of prostatic inflammation. *Korean J Urol* 2012;53:50–53.
 5. Saribacak A, Yilmaz H, Ciftci S, et al. The role of empiric antibiotic treatment in preventing unnecessary prostate biopsies in asymptomatic patients with PSA levels between 4 and 10 ng/ml. *Int J Clin Exp Med* 2014;7:2230–2235.
 6. Shtricker A, Shefi S, Ringel A, et al. PSA levels of 4.0–10 ng/mL and negative digital rectal examination. Antibiotic therapy versus immediate prostate biopsy. *Int Braz J Urol* 2009;35:551–558.
 7. Toktas G, Demiray M, Erkan E, et al. The effect of antibiotherapy on prostate-specific antigen levels and prostate biopsy results in patients with levels 2.5 to 10 ng/mL. *J Endourol* 2013;27:1061–1067.
 8. Busato WF, Almeida GL, Geraldo J, et al. Does PSA reduction after antibiotic therapy permits postpone prostate biopsy in asymptomatic men with PSA levels between 4 and 10 ng/mL? *Int Braz J Urol* 2015;41:329–336.
 9. Serretta V, Catanese A, Daricello G, et al. PSA reduction (after antibiotics) permits to avoid or postpone prostate biopsy in selected patients. *Prostate Cancer Prostatic Dis* 2008;11:148–152.
 10. Wang W, Hu WL, Yang H, et al. Effects of antibiotic and anti-inflammatory treatment on serum PSA and free PSA levels in patients with chronic prostatitis IIIA. Article in Chinese. *Zhonghua Nan Ke Xue*. 2006;12:787–790.
 11. Huang BX, Su HC, Sun FK. Compound ciprofloxacin suppository combined with ningbitai and yunnan baiyao for histological prostatitis with PSA elevation. Article in Chinese. *Zhonghua Nan Ke Xue* 2012;18:986–990.
 12. Faydaci G, Eryildirim B, Tarhan F, et al. Does antibiotherapy prevent unnecessary prostate biopsies in patients with high PSA values? Article in Spanish. *Actas Urol Esp* 2012;36:234–238.
 13. Kaygisiz O, Uğurlu O, Kořan M, et al. Effects of antibacterial therapy on PSA change in the presence and absence of prostatic inflammation in patients with PSA levels between 4 and 10 ng/ml. *Prostate Cancer Prostatic Dis* 2006;9:235–238.
 14. Dirim A, Tekin MI, Koyluoglu E, et al. Do changes in a high serum prostate-specific antigen level and the free/total prostate-specific antigen ratio after antibiotic treatment rule out biopsy and the suspicion of cancer? *Urol Int* 2009;82:266–269.
 15. Kyung YS, Lee HC, Kim HJ. Changes in serum prostate-specific antigen after treatment with antibiotics in patients with lower urinary tract symptoms/benign prostatic hyperplasia with prostatitis. *Int Neurourol J* 2010;14:100–104.
 16. Yoo DS, Woo SH, Cho S, et al. Practice patterns of urologists in managing Korean men aged 40 years or younger with high serum prostate-specific antigen levels. *Urol* 2014;83:1339–1343.
 17. Ozden C, Ozdal OL, Guzel O, et al. The correlation between serum prostate specific antigen levels and asymptomatic inflammatory prostatitis. *Int Urol Nephrol* 2007;39:859–863.