OPEN ACCESS

GAVIN PUBLISHERS

Journal of Urology and Renal Diseases

Aggarwal G, et al. J Urol Ren Dis 04: 1156.

Mini Review

DOI: 10.29011/2575-7903.001156

Prostate Cancer Screening and the PSA Conundrum

Gaurav Aggarwal[1*], Sujoy Gupta[1] and Samiran das Adhikary[2]

[1]Department of Uro-Oncology, Tata Medical Center, Kolkata, West Bengal, India

[2]Department of Urology, Apollo Hospital, Bhubaneshwar, Odisha, India

[*]**Corresponding author:** Gaurav Aggarwal, Department of Uro-Oncology, Tata Medical Center, Kolkata, West Bengal-700156, India. Email(s): gaurav.aggarwal@tmckolkata.com/ drgaurav1981@rediffmail.com

Citation: Aggarwal G, Gupta S, das Adhikary S (2019) Prostate Cancer Screening and the PSA Conundrum. J Urol Ren Dis 04: 1156. DOI: 10.29011/2575-7903.001156

Received Date: 13 September 2019; **Accepted Date:** 30 September 2019; **Published Date:** 07 October, 2019

Abstract

Prostate Specific Antigen or "PSA", one of the most commonly performed tests for prostate cancer screening, is a co-nundrum in itself. There are proponents both "for" as well as "against" the use of this investigation. Our min-review highlights this scenario both for physicians as well as patients themselves, and aims to shed some light into this controversial or rather ill-understood assay.

Keywords: Prostate Cancer; Prostate Specific Antigen; PSA; Screening test

PSA or "Prostate Specific Antigen" is one of the most common blood tests carried out by physicians in general, and urologists, in particular. Be it hematuria, burning micturition, Lower Urinary Tract Complaints (LUTS) or just as a part of routine health check-up, PSA seems to be the first test that comes to mind, for a majority of clinicians, to rule out prostate cancer, especially in any gentleman above the ripe age of 50. As the name states, PSA is definitely "specific" for the prostate, but is "not specific" for prostate cancer, as is the common notion. So, is there any role of getting this test done at all? In accordance with available literature, there is no difference between testing the PSA for asymptomatic men (population based screening) and getting it done for men who present with lower urinary tract symptoms. Studies by Catalona, et al. [1] and Young, et al. [2] have proven that men with LUTS are at no greater risk of prostate cancer than asymptomatic men of the same age.

The positive predictive values of prostate cancer detection in men with hematuria, hematospermia, dysuria, frequency, urgency and poor flow have been reported as low as 36%, 36%, 26%,22%, 21% and 23% respectively. [1] Based on this evidence, the Australian guidelines underscore that ''men with uncomplicated LUTS should be advised that current data suggest that they have little or no increased risk of prostate cancer'' [3]. So, is there any role of PSA at all? There is no doubt that carcinoma prostate is a common malignancy and one of the leading causes of cancer related deaths. But, the question is "do we have a reliable screening test?" In other words, is PSA really useful and reliable as a screening tool in early detection of prostate cancers? The evidence to support this seems sparse. First of all, there is no safe PSA level below which a man may be reassured that he does not have a biopsy-detectable prostate cancer. An average man over 50 years with a benign feeling prostate on digital rectal examination (DRE) has the following chance of having a biopsy-detectable prostate cancer at various PSA levels (Table 1) [3].

PSA level ng/ml	Biopsy detectable prostate cancer
0.0 - 0.5	6%
0.6 - 1.0	10%
1.1 - 2.0	17%
2.1 - 3.0	24%
3.1 - 4.0	27%
>4.0	44%

Table 1: Biopsy detectable prostate cancers at various PSA levels.

Thus, there is no PSA level below which a prostate cancer does not exist. Instead, there is a continuum of risk at all values. Another problem with PSA screening is a low specificity for prostate cancer. PSA values can be found to be raised in about 25 to 46% men with a benign enlargement of the prostate [4] with

the reported positive predictive value of PSA screening being only around 32 percent, two out of three screened men with PSA > 4 mg/ml will not have cancer [4]. Once a PSA level is found to be elevated, in particular above the "arbitrary cut off" of- 4 ng/ml, a prostatic biopsy seems sacrosanct medically as well as medico-legally. This biopsy is not without its own shortcomings. The optimum core number and pattern of biopsy remains debatable. At present, a Transrectal Ultrasound (TRUS) guided 12 core biopsy is considered as the "standard biopsy". However, if negative, a repeat saturation or super-saturation biopsy (more than 20 cores) is often mandated or rather recommended [5,6]. Therefore, if a PSA value is raised, it is safe to say that even a biopsy cannot completely rule out prostate cancer.

There is also a large disparity between histologically and clinically relevant prostate cancer. Autopsy studies and studies in healthy organ donors reflect that over the age of 50, histologically evident cancer reaches 50% [7,8]. On the contrary, at the same age, the lifetime risks of clinical and fatal prostate cancers are only 10% and 3% [9,10]. This brings us to the condition of over-detection. And since there are no reliable biomarkers to selectively identify the potentially aggressive prostatic cancers, over detection would lead to overtreatment, which, in turn, may lead to serious morbidities like impotency, incontinence, post-surgical margin positivity (the "prostatic trifecta" that a patient wants none of) and ultimately a poor quality of life [11,12]. Approximately 90% of men, once diagnosed with prostate cancer, would opt for some intervention, including surgery, radiation therapy or androgen deprivation despite a low risk probability at the time of diagnosis [12]. Does this PSA based early detection and treatment actually improve the clinical outcome? Data fails to support this, rather attributes the apparent mortality benefit in the screened group as an artefact of screening viz. 'length time bias' and 'lead time bias' [12].

Purists in favour of Evidence based management would refer to the various international guidelines as regards PSA based screening. However, there is no consensus among various guidelines on the age at which to start PSA screening, if at all. Recommendations are usually to start no later than at age 55 and involve well-informed men in good health and an expected life expectancy of at least 10-15 years. There are also suggestions to start screening in early midlife for men with familial predisposition and men of African-American descent. Others suggest starting conversations at age 45 for all men, with varied re-screening intervals. The table below (Table 2) gives a brief summary of the major guideline recommendations as regards PSA based prostate cancer screening, with a disclaimer that it should be a "shared decision making", between the doctor and the patient [13].

Guideline	Age of PSA based screening (Years)
NCCN	45
EAU-ASTRO	50 ; 45 if Family history or Afro-American ancestry
AUA	55 - 69
ASCO	50

Table 2: Major guideline recommendations on Age of starting PSA based screening.

So is PSA "Prostate Specific Antigen" or "Patient Suicidal Antigen", the debate still persists. To conclude, the following statement by Willet Whitmore still holds very true: "Is cure possible, when it is necessary, and Is cure really necessary, when possible?"

References

1. Catalona WJ, Richie JP, Ahmann FR, et al. (1994) Comparison of digital rectal examination and serum prostate specific antigen in the early detection of prostate cancer: results of a multicenter clinical trial of 6,630 men. J Urol 151: 1283-1290.
2. Young JM, Muscatello DJ, Ward JE (2000) Are men with lower urinary tract symptoms at increased risk of prostate cancer? A systematic review and critique of the available evidence. BJU international 85: 1037-1048.
3. Novara G, Galfano A, Gardi M, et al. (2006) Critical review of guidelines for BHP diagnosis and treatment strategy. Eur Urol 5: 418-429.
4. Thompson IM, Pauler DK, Goodman PJ, Tangen CM, Lucia MS et al. (2004) Prevalence of prostate cancer among men with a prostate-specific antigen level < or =4.0 ng per milliliter. N Engl J Med 350: 2239-2246.
5. Hong YM, Lai FC, Chon CH, McNeal JE, Presti JC Jr. (2004) Impact of prior biopsy scheme on pathologic features of cancers detected on repeat biopsies. Urol Oncol 22: 7-10.
6. Pepe P, Aaragona F (2007) Saturation prostate needle biopsy and prostate cancer detection at initial and repeat evaluation. Urology 70: 1131-1135.
7. Rich AR (2007) On the frequency of occurrence of occult carcinoma of the prostate. J Urol 33: 215-3. Reprinted Int J Epidemiol 36: 274-277.
8. Yin M, Bastacky S, Chandran U, Becich MJ, Dhir R, et al. (2008) Prevalence of incidental prostate cancer in the general population: a study of healthy organ donors. J Urol 179: 892-895.
9. Scardino PT (1989) Early detection of prostate cancer. Urol Clin North Am 16: 635-655.
10. Whitmore WF (1994) Localized prostate cancer: management and detection issues. Lancet 343: 1263-1267.

11. Sanda MG, Dunn RL, Michalski J, Sandler HM, Northouse L, et al. (2008) Quality of life and satisfaction with outcome among prostate-cancer survivors. N Engl J Med 358: 1250-1261.

12. Talcott JA, Rieker P, Propert KJ, Clark JA, Wishnow KI, et al. (1997) Patient-reported impotence and incontinence after nerve-sparing radical prostatectomy. J Natl Cancer Inst 89: 1117-1123.

13. Kohestani K, Chilov M, Carlsson SV (2018) Prostate Cancer Screening- when to start and how to screen? Transl Androl Urol 7: 34-45.