

**International Journal of Pharma and Bio Sciences****ISSN  
0975-6299****RELATION OF AGE AND PROSTATE VOLUME ON PROSTATE SPECIFIC ANTIGEN LEVELS IN PATIENTS WITH BENIGN PROSTATE HYPERPLASIA****DR. A. BHAGYA LAKSHMI AND DR. CH. KALAVATHI***Assistant Professor, Dept. of Biochemistry, Gandhi Medical College, Secunderabad.***ABSTRACT**

Prostate specific antigen is not cancer specific, it can be elevated in patients with benign prostate hyperplasia (BPH). The blood sample from 80 BPH patients are estimated for PSA and the values are compared with patient's age and prostatic volume. The mean PSA for the age groups 40-50 yrs, 51-60 yrs, and 60-70 yrs and > 70 yrs were 0.9ng/ml, 1.6ng/ml, 3.2ng/ml and 4.8ng/ml respectively. The increased PSA levels are also raised along with prostatic enlargement. The size of prostate is < 30gm, 31-40gm, 41-50gm and >50gm corresponded to mean PSA values of 0.9ng/ml, 1.6ng/ml, 3.2ng/ml and 4.8ng/ml respectively. In conclusion, there is marked and significant influence of age and prostate volume on serum PSA levels. The older the patient and the largest is his prostate volume, the higher the PSA serum level.

**Key words: PSA, BPH****DR. A. BHAGYA LAKSHMI**  
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## INTRODUCTION

Normal prostate weighs 18gm, measuring 3cm in length, 4cm in width and 2cm in depth and traversed by prostatic urethra.<sup>1</sup> Although ovoid, it is having anterior, posterior and lateral surfaces with narrow apex and inferiorly and a broad base superiorly, continuous with base of the bladder, the apex of the prostate is continuous with striated urethral sphincter. Benign prostate hyperplasia is an extremely common disorder in men over 50 yrs. It is characterized by hyperplasia of prostatic stromal and epithelial cells, resulting in the formation of large, fairly discrete nodules in the periurethral region of the prostate. Prostatic enlargement is related to the action of androgens.<sup>2</sup> Prostate specific antigen is synthesized by the epithelial cells lining the acini and ducts of prostate gland is secreted via ductal system of prostate and stored in high concentrations in seminal fluid. With the help of immunoassays low levels of serum PSA are detected in healthy men. PSA concentration increases with advancing age in different population. Cross sectional data suggest that PSA increases 4%/ml of prostate volume and that 30% and 5% of variance in PSA can be accounted for by prostate volume and age.<sup>3</sup> In men without BPH, rate of change in PSA is 0.04ng/ml per year (Carter et al.1992b; Oesterling et al: 1993).<sup>4</sup> Compared with 0.07-0.27ng/ml per year in men with BPH who are between ages 60-85 yrs (Carter et al: 1992b).<sup>5</sup> Fowler and Colleagues (1999) have

demonstrated that on a volume / volume basis, the benign prostate tissue of African and American men contributes more PSA to sera than does the benign prostatic tissue of white men, a difference that increases with age.<sup>6</sup> The location and grade of tumor also modulates the effect of tumor volume (Christensen et al: 1990), (Greene et al: 1991).<sup>7</sup> Based on trans rectal ultrasonogram, the growth of prostate in men 40-80 yrs old was estimated to be about 0.6 ml/year or 6ml / decade of life. However prostate growth pattern with a slope estimate of 0.4ml / year for men age 40-60 yrs at base line and of 1.2ml / year for those 61-80 yrs at base line. (Rhoden et al: 1995). An updated analysis revealed a median growth rate of about 1.9% / year independent of age and symptoms. However a higher baseline serum PSA and larger prostate volume predicted greater annualized volume increases. (Rhoder et al: 1999) PSA in serum does correlate with pathological state and tumor volume (Stamely et al: 1989; Nodus et al: 1998)<sup>8</sup> Myrtle et al found that 100% healthy men < 40 yrs and 97% of men 40 yrs or older had a serum PSA of below than or equal to 4ng/ml. Of the 3% of men 40 yrs or older, none had a PSA value greater than 10ng/ml.<sup>9</sup> Volume: The transverse dimension (from left to right side of the gland) is then measured, and the volume is calculated by the formula

$$8 \times \text{surface area} \div 2 \pi \times \text{transverse dimension}$$

Because the specific gravity of prostate tissue is 1.050 (Watanabe et al, 1974), the volume in cubic centimeters is comparable to the weight in grams.<sup>10</sup>

## MATERIALS AND METHODS

The study has been undertaken to compare the age, prostate volume and PSA levels in

Group-I	:	40-50 yrs
Group-II	:	51-60 yrs
Group-III	:	61-70 yrs
Group-IV	:	71-80 yrs

BPH cases. This study was carried out in the department of Biochemistry and Urology department at Gandhi Medical College and Hospital, Secunderabad. Total no. of subjects are 80. All the men in the age group of 40-80 yrs. The blood samples were taken before the surgery had done. During the resting condition of patients sample were taken.

All the men with BPH with urinary symptoms and ultrasonogram findings. PSA levels were studied on blood samples of all groups.

**Exclusion criteria**

Lower urinary tract infection.

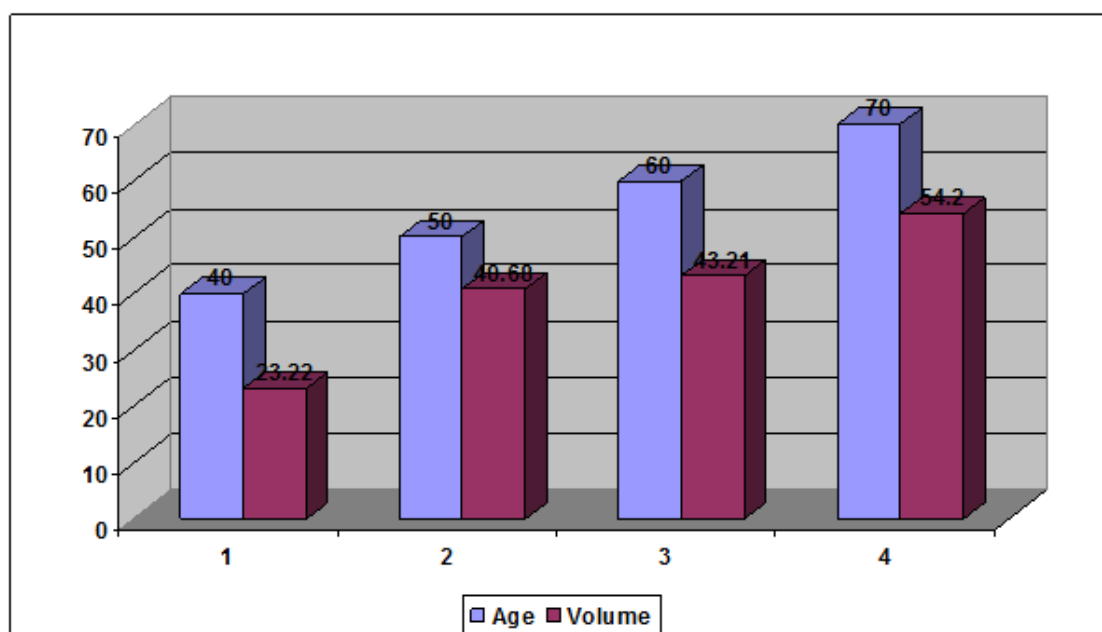
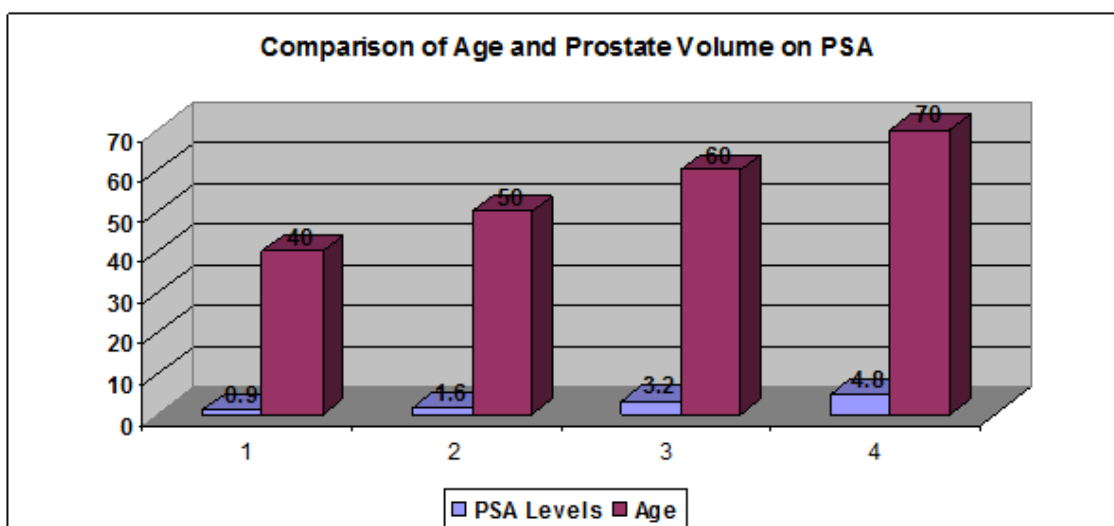
**Inclusion criteria**

Symptoms, Signs, trans rectal ultrasonography.

**RESULTS**

Age (Yrs)	Age (Mean)	PSA levels (Mean) ng/ml
40-50	46	0.9
51-60	56	1.6
61-70	65	3.2
71-80	76	4.8

Age (Yrs)	Age (Mean)	Volume of Prostate
40-50	46	23.22
51-60	56	40.68
61-70	66	43.21
71-80	76	54.20



## DISCUSSION

We included 80 men of different age groups and prostate volume in urology out patient and surgical care unit, Gandhi Hospital, Secunderabad. Among 80 men, 20 are 40-50 yrs, 20 are 51-60 yrs age, 20 are 61-70 yrs age and 20 are 71-80 yrs of age. The prostate volume correspondingly was less than 30 gm is group-I, 31-40 gm in group-II, 41-50gm in group-III and more than 50gms in group-IV. Diagnosis was further confirmed by Trans rectal ultrasonogram (TRUS). In this study the PSA volume of BPH are significantly higher in higher age groups and increased prostatic volume.

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## Summary and Conclusion

The present study was undertaken to assess the value of PSA in BPH of different age groups and different prostatic volume in the department of Biochemistry, Gandhi Medical College and Hospital. All the patients are over 40 yrs of age. The patients were taken after ultrasonogram (Trans rectal). Lower urinary tract infection is excluded in all the cases, PSA levels are elevated in BPH with increasing age. PSA levels are elevated in BPH with increasing prostatic volume. In conclusion PSA is clearly increasing in BPH cases with advancing age and increased prostate volume.