

THE EFFECT OF CLEAN INTERMITTENT SELF-CATHETERIZATION ON SERUM PROSTATE-SPECIFIC ANTIGEN LEVELS IN MALES WITH VOIDING DYSFUNCTION

Hypothesis / aims of study

Prostate-specific antigen (PSA) is one of the most useful and widely used tumor markers for prostate cancer. Large-scale studies have documented the efficacy of PSA with respect to the diagnosis of prostate cancer, and as a means to differentiate between benign prostatic hyperplasia (BPH) and prostate cancer. Elevated serum PSA levels are found in patients with prostate cancer, BPH, prostatic inflammation, and following urological procedures. Transrectal ultrasonography (TRUS) and prostatic biopsy have also been shown to increase serum PSA levels [1]. Acute urinary retention can dramatically increase the serum PSA levels in patients with BPH. Digital rectal examination (DRE), previously thought to increase PSA levels, has not been shown to alter serum PSA levels [2]. Several reports have studied the effect that the presence of a urethral catheter can have on PSA levels. However, the effect of urethral catheterization on PSA levels is controversial. Furthermore, no previous studies have examined the effect of clean intermittent self-catheterization (CIC) on serum PSA levels. In this study, we investigated the relationship between serum PSA levels and CIC.

Study design, materials and methods

Twenty-five males (age, 35-85 years; mean, 62.1 years) who required CIC due to voiding dysfunction were included. All patients gave their written informed consent to be involved in this study. There were 4 patients with HTLV-1-associated myelopathy, 3 with spinocerebellar degeneration, 2 with cerebrovascular disease, 4 with BPH, and 1 with spinal cord injury, as well as 11 patients with other disorders, such as neurogenic bladder. Patients were excluded if they were clinically suspected of having prostate carcinoma or prostatitis. Clinical data, such as prostate volume, daily CIC frequency, presence of urinary tract infections, the length of time that the patient had been performing CIC, time from the last CIC, and age, were investigated. The prostate volume was investigated using TRUS, which was done after blood samples were taken, because TRUS has been shown to increase serum PSA levels above baseline values. At the time that the blood samples were taken for the serum PSA levels, the time from the last CIC was determined. The correlations between the serum PSA levels and these clinical factors were analyzed using Spearman's rank correlation coefficient. Furthermore, the association between serum PSA levels and coexisting clinical factors was determined by multiple regression analysis. Statistical significance was defined as a P value of <0.05.

Results

The mean serum PSA level, age, CIC duration, daily CIC frequency, and the time from the last CIC are shown in Table 1.

Table 1: Clinical factors in CIC patients

Clinical factors	Mean ± SD
PSA (ng/ml)	4.1 ± 8.5
Age (yr)	62.1 ± 12.8
Duration of CIC (mo)	24.1 ± 41.7
Prostate volume (ml)	28.9 ± 27.3
Daily CIC frequency	4.2 ± 1.9
Time from the last CIC (min)	258 ± 337.7

Using Spearman's rank correlation coefficient, there were no significant correlations between serum PSA levels and age, CIC duration, presence of urinary tract infection, daily CIC frequency, and the time from the last CIC. However, there was a significant correlation between the serum PSA level and prostate volume ($P < 0.05$). On multivariate regression analysis, only prostate volume was significantly related to serum PSA level ($P < 0.01$) (table 2).

Table 2: The correlation between serum PSA levels and clinical factors in CIC patients

urinary infection	Clinical factor	PSA level		UTI: tract
		Univariate (P values)	Multivariate (P values)	
	Age	n.s	n.s	
	Duration of CIC	n.s	n.s	
	Prostate volume	0.01	0.005	
	Daily CIC frequency	n.s	n.s	
	Time from the last CIC	n.s	n.s	
	Presence of UTI	n.s	n.s	

Interpretation of results

If CIC affects serum PSA levels, then serum PSA levels could not be used to diagnose prostate cancer early and accurately. There was a significant correlation between the serum PSA level and prostate volume on univariate and multivariate analysis. Other clinical factors, such as daily CIC frequency, presence of urinary tract infection, duration of CIC, time from the last CIC, and age, were not correlated with serum PSA levels. In other words, CIC does not affect serum PSA levels, and serum PSA levels are not increased by CIC. Samples for PSA measurement yield reliable results when taken within 24-48 h of flexible cystoscopy [3]. In our institution, patients performing CIC use a 10 or 12 Fr. urethral catheter; the caliber of this size is thinner

than that of a flexible cystoscope. CIC is a more physiological procedure than flexible cystoscopy; thus, the effect of CIC on serum PSA levels is less than that of flexible cystoscopy. In CIC patients who have serum PSA levels that are greater than the normal cut-off, prostate cancer should be considered.

Concluding message

Even though this was a small study, CIC does not appear to affect serum PSA levels. An elevation of serum PSA levels in patients performing CIC could indicate the need to evaluate them for prostate cancer.

References

1. 1. Urology (1993) 42; 276-282
2. 2. J Urol (1992) 147; 810-814
3. 3. Ann Clin Biochem (1999) 36; 340-346

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<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
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<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes