DIFFERENCE IN SERUM PSA LEVEL AND IIEF-5 BEFORE AND AFTER TURP IN BPH PATIENTS WITHOUT URINARY RETENTION

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ABSTRAK

Tujuan Penelitian: Mengkaji bagaimana sifat dan perubahan PSA, IIEF-5 setelah TURP pada BPH-LUTS. ***Bahan & Cara:*** *Pada 18 pria umur antara 50-69 tahun, terbagi 2 kelompok 50-59 dan 60-69 tahun, rerata umur masing-masing kelompok 56,5 tahun dan 67,2 tahun. Pemeriksaan pre operasi meliputi PSA serum dan IIEF-5, volume prostat yang diukur dengan TRUS, PSA, dan IIEF-5 dievaluasi sebelum operasi dan 30, 60, 90 hari.* ***Hasil Penelitian:*** *PSA cenderung menurun setelah TURP pada seluruh evaluasi 30, 60, 90 hari. Rerata PSA sebesar 72,2% (530 hari), 72,2% (60 hari) dan 77,8% setelah 90 hari. Kadar rerata PSA pre op 5,3 ± 3,3 ng/ml dan setelah TURP bervariasi 3,5 ± 3,0 ng/ml (30 hari), 2,9 ± 2,9 ng/ml (60 hari), 1,8 ± 1,3 ng/ml (90 hari). Terdapat perbedaan signifikan PSA pre op dengan PSA 60, 90 hari kelompok umur 50-59 tahun dan terdapat perbedaan signifikan PSA pre op dengan 90 hari pada kelompok umur 60-69 tahun. Antara kelompok umur tidak terdapat perbedaan yang signifikan dengan nilai p > 0,05. Besarnya penurunan PSA serum dalam pergram volume reseksi prostat didapat 0,10 ng/ml/gram pada 30 hari, 0,16 ng/ml/gram (60 hari) dan 0,24 ng/ml/gram dalam 90 hari. Tidak terdapat pasien dengan skor IIEF-5 normal berubah menjadi disfungsi ereksi. Penurunan IIEF-5 skor lebih besar kelompok 50-59 tahun pada hari ke 30 namun peningkatan terjadi pada hari ke 60 dan 90 sedangkan kelompok 60-69 tahun tetap terjadi penurunan. Terdapat perbedaan signifikan IIEF-5 pre op dengan hari ke-30, sedangkan dengan hari ke 60, 90 hari tidak menunjukkan perbedaan yang signifikan. IIEF-5 pre op dengan hari ke 60 dan 90 Antara kelompok umur 50-59 dan 60-69 tahun terdapat perbedaan signifikan p < 0,05. Didapatkan temuan penelitian BPH dengan prostatitis n = 8 namun tidak ada perbedaan penurunan PSA serum pre op dengan 30, 60, 90 hari dibandingkan dengan BPH tanpa prostatitis.* ***Simpulan:*** *Kadar PSA menurun drastis pada pasien yang menjalani TURP. Titik nadir PSA terjadi pada 90 hari. Volume reseksi prostat sebagai parameter estimasi rerata penurunan PSA serum. Rendahnya komplikasi disfungsi ereksi, sehingga TURP merupakan prosedur yang masih aman. Penemuan prostatitis tidak mempengaruhi nilai variabel dan tidak ada perbedaan penurunan PSA.*

Kata kunci: *Prostate-specific antigen, benign prostatic hyperplasia, transurethral resection of prostate, disfungsi ereksi.*

ABSTRACT

Objective: Determine change in serum prostate-specific antigen (PSA) and International Index of Erectile Function (IIEF-5) following transurethral resection of the prostate (TURP). *Material & Method:* Eighteen men with age range of 50 – 69 years, were divided in two groups, group I 50-59 years (mean 56,5) and group II 60-69 years (mean 67,2). Both groups underwent measurement of serum PSA and IIEF-5 pre-operative, and repeated at 30, 60, and 90 days after TURP. *Results:* Level of serum PSA after TURP is decreased in most patients after 30, 60, and 90 days (72%, 72% and 78%). Mean value of PSA pre-operatively is 5,3 ± 3,3 ng/ml. After TURP, serum PSA level was 3,5 ± 3,0 ng/ml (30 days); 2,9 ± 2,9 ng/ml (60 days) and 1,8 ± 1,3ng/ml (90 days). Pre-operative PSA level was significantly decreased in Group I during the 60 and 90 days post TURP, while in Group II pre-operative PSA level was significantly decreased only in 90 days of observation. Overall there is no significant difference in PSA levels in both groups (p > 0,05). The decrease of PSA per gram resected in 30, 60, and 90 days were 0,10 ng/ml; 0,16 ng/ml and 0,24 ng/ml consecutively. There is no change in normal IIEF-5 score. Decrease of the IIEF-5 score in group I was measured at 30 days, but the score increased after 60 and 90 days. Meanwhile Group II showed decrease of IIEF-5 score. Pre-operative IIEF-5 score compared to the 30 days post TURP was significantly different but not significantly different compared with to score at 60 and 90 days. In Group I IIEF-5 score was significantly higher compared to Group II (p < 0,05). Prostatitis was found in 8 patients, but there is no difference in serum PSA level decrease between patients with or without prostatitis. *Conclusion:* There was significant decrease in serum PSA after TURP in BPH patients with LUTS at every measurement at 30, 60, and 90 days. PSA level after TURP depends on various factors, including pre-operative PSA, pre-operative prostate volume and prostate volume resected. Incidence of erectile dysfunction post TURP was low.

Keywords: Prostate-specific antigen, benign prostatic hyperplasia, transurethral resection of the prostate, erectile dysfunction.

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INTRODUCTION

Prostate Specific Antigen (PSA) is a tumor marker with a role in diagnosing and evaluating diseases of the prostate and its use continues to increase further. The nature of change in PSA after TURP is very important, because of its limitations as a tumor marker of prostate cancer whose values overlap with BPH. Failure of PSA to reach nadir after TURP indicates the existence of residual cancer or inflammation. Prostate-inflammatory effects on post-TURP serum PSA value are not fully understood. Although many studies suspect this inflammation contributes to increased PSA level, there remains controversy over its mechanism, such as presence of histopathological changes that induces prostate acini marker entry into systemic circulation.[1,2]

In a previous study by Fonseca et al (2008) there was no age-related decline in PSA level after TURP in all measurements.[1] Whereas a study by Chung et al (2006) found strong correlation between age and increasing serum PSA, in which the increase was 35,9% per decade of life.[3] Further studies are needed on change of serum PSA to analyze whether age contributes to different decrease in serum PSA after TURP.

Frequent TURP in Soetomo Hospital has encouraged the authors to carry out further investigation. Previous retrospective studies revealed 123 BPH patients who underwent TURP from January to December 2005. Of 123 BPH patients, 70 were associated with urinary retention and the remaining 53 were BPH patients with Lower Urinary Tract Symptom (LUTS).[4]

Prostate Specific Antigen (PSA) is a tumor marker derived from prostatic epithelial cells used in the diagnosis and evaluation for patients with prostate diseases. Although many factors affect PSA decline after TURP, its value ranges from 72% less from the initial value, even though the volume of the resected prostate is small. This is because the resected tissue is largely from the transitional zone, which is the highest PSA producer.[1] Those issues should be reexamined in light of the differences in races and populations as well as examination method, which may provide varied outcome data about PSA.

Complications resulting from TURP include erectile dysfunction (ED), necessitates simultaneous analysis in this study. Evaluation was performed using International Index of Erectile Function-5 (IIEF-5) score as a subjective parameter of erectile function assessment. Previous research has shown incidence of ED after TURP between 4-40%. Difference in incidence of post-TURP ED is caused by differences in methods used to assess ED due to differences in time of post-TURP follow-up, and one of the most important factors of diagnosis and evaluation of ED is erectile function.[5] Incidence of post-TURP erectile dysfunction varies widely, ranging from 0-40%, while, according to Taher (2004) 14%, and Paulakis (2006) 12%.[5,6] The IIEF-5 scoring system has not been examined for validity and reliability in BPH patients without urinary retention in Indonesia, particularly in Surabaya.

OBJECTIVE

To compare the change in serum PSA levels and IIEF-5 score before and after TURP in BPH patients without urinary retention.

MATERIAL & METHOD

This study was an observational analytic study conducted from January to August 2010, to study differences in serum PSA levels, IIEF-5 score, differences in serum PSA changes by age group and PSA change per volume of prostate resected (g) in BPH patients without urinary retention, as well as testing the validity and reliability of the IIEF-5 scoring system questionnaire in Indonesian.

Overall sample size that fulfilling the inclusion criteria was 20 individuals who were divided into 2 observations groups by age, from 50-59 years and 60-69 years. There was 1 drop out in each group refusal to continue follow up (PSA examination and complete IIEF-5 until days 60 and 90) because feeling better. Each age group of 50-59 years and 60-69 years comprised 9 individuals. Inclusion criteria in this study were (1) male patient diagnosed with BPH without urinary retention undergoing TURP, (2) age from 50 to 69 years, (3) PSA value 10 ng/ml.

Data were analyzed descriptively and analytically. Prior to conducting the hypothesis tests, test on data distribution and homogeneity was performed. The difference between PSA, IIEF-5 on days 30, 60, and 90 post-TURP, and the volume of prostate resected were tested using Anova or t test that were previously tested for normality using Kolmogorov Smirnov. Data were analyzed with commercial software. Results of normality tests on all data showed normal distribution (p > 0,05), so that

the statistical test used was parametric statistical tests, the paired t test and independent t test.

RESULTS

The assessment result of two independent samples t test on the volume of prostate resected and prostate volume showed no difference (Table 1). So it can be said resection of prostate volume and prostate volume between the two groups was homogeneous and it can be seen that the two variables were not confounding factors.

Table 2 shows the changes in the decrease of pre-surgical PSA in all groups after TURP in days 30, 60, and 90 of observation. On day 90 post-TURP serum PSA decreased below 4 ng/ml.

Changes in serum PSA showed improvement and reduction of the difference in pre-surgical PSA to day 30, 60, and 90 (Table 3). This change was dominated by patients whose serum PSA decreased, despite some of the patients still having elevated PSA. Persistent elevated PSA may be caused by inflammation resulting from the TURP procedure. Increased PSA was found in 5 patients from both groups on day 30 and 60, and 4 patients on day 90.

In age group 50-59 years, statistical testing showed significant differences in pre-surgical PSA

with PSA on day 60 and 90 (Table 4), and no significant difference between pre-surgical PSA with PSA on day 30. Calculation in age group of 60-69 year showed significant differences in pre-surgical PSA with PSA on day 90, while pre-surgical PSA with PSA on day 30 and 60 did not show significant differences.

Table 5 showed no significant difference in pre-surgical PSA with PSA on day 30, 60, and 90 (p > 0,05).

PSA decrease on day 30 per gram tissue resected (table 6) is smallest, 0,1023 ng/ml. PSA decrease on day 60 was 0,1638 ng/ml per gram tissue resected, whereas the largest decrease per tissue resected was observed on day 90 (0,2495 ng/ml). Comparison of serum PSA decrease pergram volume resected in this study could be used as an estimate.

Table 7 showed significant differences in pre-operative IIEF-5 with the IIEF-5 on day 30, while pre-operative IIEF-5 with IIEF-5 on day 60 and 90 did not show significant differences.

Table 8 showed no significant difference in pre-operative IIEF-5 decrease with IIEF-5 on day 30 (p > 0,05), but there were significant differences in the decrease of pre-operative IIEF-5 with IIEF-5 score on day 60 and 90 (p < 0,05).

Results calculated with two independent samples

Table 1. Description of research data.

Observed aspects	50 - 59 years			60 - 69 years			Independent samples t test
	Mean	N	SD	Mean	N	SD	
Age	56,5	9	1,5	67,2	9	2,1	0,001*
Prostate volume	30,40	9	12,572	36,18	9	13,916	0,369
Resected tissue weight	13,14	9	9,579	17,51	9	10,426	0,368
PSA Pre-operative	5,1956	9	3,322	5,4878	9	3,551	0,859
PSA day 30	2,8444	9	2,484	4,2000	9	3,462	0,354
PSA day 60	2,1444	9	1,563	3,8333	9	3,867	0,242
PSA day 90	1,7333	9	1,580	1,9667	9	1,125	0,723
IIEF Pre-operative	13,3333	9	8,573	9,0000	9	5,958	0,231
IIEF day 30	8,6667	9	8,485	4,6667	9	4,555	0,231
IIEF day 60	16,5556	9	9,748	6,1111	9	4,729	0,014*
IIEF day 90	15 7778	9	8 643	5 0000	9	4 387	0 004*

Note*= Significant at 0,05

Table 2. Description of pre-surgical PSA data.

	PSA Pre-operative	PSA day 30	PSA day 60	PSA day 90
Mean	5,3417	3 5222	2 9889	1 8500
Std. Deviation	3 33938	3 00520	2 99016	1 33560

Table 3. Description of the difference and percentage of increase or decrease in PSA.

Difference of PSA pre and day 30	Categories	Difference of PSA pre and day 60	Categories	Difference of PSA pre and day 90	Categories
-3,2	Increased	-1,7	Increased	0,6	Decreased
-1,1	Increased	-1,1	Increased	-3,4	Increased
1,2	Decreased	4,7	Decreased	6,5	Decreased
3,46	Decreased	5,26	Decreased	5,26	Decreased
2,4	Decreased	1,8	Decreased	3,4	Decreased
3,4	Decreased	2,7	Decreased	4	Decreased
1,1	Decreased	1,1	Decreased	0,9	Decreased
7	Decreased	7,9	Decreased	8,1	Decreased
6,9	Decreased	6,8	Decreased	5,8	Decreased
8,7	Decreased	8,8	Decreased	9,7	Decreased
2,79	Decreased	2,89	Decreased	1,89	Decreased
-5,5	Increased	-4,6	Increased	-1,6	Increased
0,8	Decreased	1,5	Decreased	-1,9	Increased
5,1	Decreased	-4	Increased	7,6	Decreased
-1,4	Increased	-0,5	Increased	-1	Increased
2,8	Decreased	3	Decreased	5,5	Decreased
5,8	Decreased	5,6	Decreased	8,8	Decreased
7 5	Increased	2 2	Decreased	2 7	Decreased
% Increased	27,8%		27,8%		22,2%
% Decreased	72,2%		72,2%		77,8%

Table 4. PSA paired t test.

Variables	Age 50 59 years		Age 60 69 years	
	t	Sig	t	Sig
PSA Pre-operative – PSA day 30	2 100	0 069	0 728	0 487
PSA Pre-operative – PSA day 60	2,722	0,026*	1,162	0,279
PSA Pre-operative – PSA day 90	2 915	0 019*	2 319	0 049*

Note* = significant at alpha 0,05

Table 5. PSA independent t test.

Groups	Homogeneity	t	Sig.
PSA Pre-operative – PSA day 30	Homogeneous	0,508	0,618
PSA Pre-operative – PSA day 60	Homogeneous	0,771	0,452
PSA Pre operative PSA day 90	Homogeneous	0 031	0 976

Table 6. Decrease of serum PSA per gram prostate tissue resected.

Statistics	PSA decrease/tissue weight on day 30	PSA decrease/tissue weight on day 60	PSA decrease/tissue weight on day 90
Mean	0 1023	0 1638	0,2495
Std. Deviation	0 46003	0 41905	0,46459
Minimum	-1 27	- 0 68	-0 67
Maximum	0 78	0 94	1 30

Table 7. Paired t test of IIEF-5 score.

Variables	Age 50 – 59 years		Age 60 – 69 years	
	t	Sig	t	Sig
IIEF Pre-operative and IIEF day 30	2,514	0,036*	2,871	0,021*
IIEF Pre-operative and IIEF day 60	-2,029	0,077	2,080	0,071
IIEF Pre-operative and IIEF day 90	-1 777	0 113	2 248	0 055

Note* = significant at alpha 0,05

Table 8. Independent t test IIEF-5.

Groups	Homogeneity	t	Sig.
IIEF Pre-operative and IIEF day 30	Homogeneous	0,139	0,891
IIEF Pre-operative and IIEF day 60	Homogeneous	2,897	0,011*
IIEF Pre-operative and IIEF day 90	Homogeneous	2,865	0,011*

Note* = significant at alpha 0,05

Table 9. Research data and t test results in patients with BPH-LUTS without prostatitis and BPH-LUTS with prostatitis.

Observed aspects	BPH without prostatitis			BPH with prostatitis			t test sig.
	Mean	N	SD	Mean	N	SD	
Difference of PSA pre and day 30	2,7560	10	3,58928	0,6487	8	5,13805	0,321
Difference of PSA pre and day 60	2,1160	10	3,95338	2,6487	8	3,84216	0,777
Difference of PSA pre and day 90	3,1960	10	4,14881	3,8613	8	3,97668	0,735

t test (table 9) showed no difference in pre-surgical PSA decrease with that on days 30, 60, and 90 between BPH-LUTS without prostatitis compared to BPH-LUTS with prostatitis.

DISCUSSION

Samples included in this study were BPH-LUTS patients with age more than 50 years. This is in accordance with McConnell (2005) that the prostate enlarges gradually after the age of 50 years or more and after age 70, about 8 out of 10 males may have an enlarged prostate.[7]

The decrease from initial total PSA between pre-surgery up to day 90 was as much as 3,4623 ng/ml. This decrease was possible because resection of PSA-producing epithelial cells cause reduced PSA production. Gradual decrease in serum PSA on day 30 may be attributed to inflammation, which is followed by tissue healing. Serum PSA on day 60 it continues to reduce toward nadir, with further reduction up to day 90. This is regarded as the lowest point compared to baseline in age group 50-59 years. Similarly, the findings of Fonseca et al (2008) revealed that serum PSA concentrations increased transiently during the first several days post-TURP and decreases gradually thereafter.[1]

Total PSA decrease from pre-surgery until day 90 was 3,5211 ng/ml, consistent with Chung et al (2006) who found a strong correlation between age and serum PSA, in which serum PSA increased 35,9% per decade of life.[3] These initial PSA values may be influenced by many factors. One example is race, the value in Afro-American men is higher than that in Caucasian men without prostate cancer. The 90th day of observation was observed as the lowest point of PSA in this study. This was possible by re-epithelialization and completion of wound healing in the first 12 weeks.[8]

Table 2 shows the trend of PSA decline after 30, 60, and 90 days compared to pre-surgical PSA. This is consistent with findings of Marks (1996) that in partial prostatectomy such as TURP for BPH related symptoms, PSA also decreased, although not reaching the zero. After adenoma removal in BPH, PSA drops drastically and proportional to the volume of resected tissue.[9] After TURP, number of prostate epithelial cells as PSA producer will be reduced, thus

causing decrease of PSA.

Regarding pre-operative PSA difference on days 30, 60, and 90 (Table 3), serum PSA decreased respectively by 72,2%, 72%, 77,8% compared to baseline PSA, but some still showed an increase by 27,8%, 27,8%, and 22,2%, respectively. So it can be inferred that the greatest difference in PSA decline of the entire observation time occurred on day 90. The results of this study was greater than that obtained by Aus G et al (1996) who measured the level of PSA before and 3 months after TURP in 190 patients with BPH and an the mean of PSA decrease was 70% post-TURP.[10] It can be stated that the greatest decline in PSA this study occurred in 3 months, indicating that complete wound healing has occurred, that the inflammatory factors have minimal influence on PSA levels, but there was also PSA increase on day 90. According to Brosman (2009) this demonstrates that in general PSA level is continually detected and still increases, possibly indicating the presence of cancer cells.[2] The presence of these cells can served as a predictor in this study because these cells are generally located in peripheral zone therefore not resected during TURP, where the peripheral zone represents 80% of the sites of origin of prostate cancer. However, this study did not obtain the results of histopathologic examination with prostate Ca.

Results assessed with paired t test (Table 4) on the PSA indicated there were significant differences in the age group 50-59 years of pre-surgical PSA on day 60 (p = 0,026) and 90 (p = 0,019), whereas pre-surgical PSA on day to 30 showed no significant difference (p = 0,069). The assessment of age group 60-69 years showed a significant difference only in pre-surgical PSA on day 90 (p = 0,049), whereas PSA on day 30 and 60 did not show significant differences (p > 0,05), respectively p = 0,487 and p = 0,279. This is due to the occurrence of post-TURP inflammatory process in which prostate epithelial cells as PSA producers are still releasing much PSA that are leaking through basal membrane into vascular system, so that high serum PSA can still be found on day in both groups.[2] On day 60, serum PSA in group of 50-59 years became significant compared to pre-operative PSA. This indicates that younger age experiences greater PSA decline compared to pre-operation. This may be because age group of 50-59 years has faster surgical wound healing, so prostate epithelial cells do not present anymore. Whereas, observation on day 90 showed that both groups had significant values. In 90 days prostate re-epithelialization has completed, so that PSA leaks

through basal membrane into vascular system is reduced and the value of PSA can be regarded as stable at this time. Unfortunately, there was no comparison of longer observation time after 90 days to assess the length of time of PSA stabilization. This is different from the study by Fonseca et al (2008), in which they found that age was not associated with post-TURP decrease in PSA levels in all measurement times.[1]

Independent t test in PSA (table 5) showed no significant difference in pre-surgical PSA decline vs that in 30, 60, and 90 days (p > 0,05) and both groups were regarded as homogeneous. A previous study by Fonseca et al (2008) found that age was not associated with post-TURP decrease in serum PSA levels in all measurement times.[1]

Tissue weight in each PSA decrease or increase in PSA on day 30 (table 6) is the smallest comparative figures of 0,1023 ng/ml, and the comparative figures in on day 60 is 0,1638 ng/ml, whereas on day 90 the comparative figures is the greatest, 0,2495 ng/ml. It can be concluded that mean decrease in serum PSA per gram obtained in this study was taken from the smallest value of the PSA value on day 30 of 0,10 ng/ml. Transitional zone is the largest source of PSA production, and if this zone is resected, the serum PSA levels would certainly decrease. Thus, prostate resection volume can be measured by PSA that results from partial adenomectomy. The results obtained in this study differed from those of Lloyd et al (1996), who found that per gram PSA decrease in resected tissue was 0,09 ng/ml.[11] The results of this study were similar to those of Marks et al (1996) who found that the mean decrease of serum PSA in per gram resected tissue was 0,11 ng/ml.[9] The difference in the results of those studies may result from different populations and methods of PSA measurement, whether it was enzymatic or by radioimmunoassay.

Paired t test results of IIEF-5 (table 7) showed significant differences of IIEF-5 in age group 50-59 years between pre-surgical score and that on day 30 (p = 0,036), while pre-operative IIEF-5 and IIEF-5 on days 60 and 90 did not show significant differences, which were p = 0,077 and p = 0,113, respectively. Similarly, in age group 60-69 years, the results of assessment also indicated that significant differences was only in IIEF-5 days 30 (p = 0,021), while IIEF-5 day 60 and 90 did not show significant differences, respectively p = 0,071 and p = 0,055. This showed a tendency of decreasing IIEF-5 score on day 30 because the patients have not had complete recovery with the persistence of fear, confidence on the degree

of erection had not recovered either, while clinically the patient still complained pain during intercourse and micturition. IIEF-5 evaluation on day 30 observation was also seemed too early to do. Some patients may experience temporary post-TURP ED and the return of erection ability may occur in 2-3 months post-TURP.[5]

Results of independent test of IIEF-5 (Table 8) shows that the results of assessment revealed no significant difference in pre-operative IIEF-5 decrease and IIEF on day 30 (p > 0,05). However, there was significant difference in pre-operative IIEF decrease and IIEF on days 60 and 90 (p < 0,05). This difference suggests that sexual erectile function in age group 60-69 years was decreasing compared to that in group of 50-59 years. According Roehrborn (2002), in BPH the role of testosterone as a male sex hormone would generally decrease due to decreased number of Leydig cells and estrogen levels in male plasma also increased due to peripheral aromatization, so this may trigger the decline of male sexual function.[12]

Assessment in Table 9 shows that the decrease of PSA in BPH with prostatitis group is larger than that of BPH patients without prostatitis. The decrease of PSA in BPH group with highest prostatitis occurred between pre-surgical vs day 30 with a mean decrease in PSA of 0,6487 ± 5,13805 ng/ml. Results assessed with two independent samples t test indicated no significant difference in pre-surgical PSA decline vs those on days 30, 60, and 90. It is possible because TURP in BPH with prostatitis may reduce sources of chronic inflammatory lesions of glandular epithelial cells. Unlike the study by Lawrenrschuk (2007), serum PSA in BPH-LUTS with prostatitis not only highly increased serum PSA but also returned to initial level, depending on the recovery of infection and may require time ranging from 6 to 8 weeks.[13]

CONCLUSION

There are differences in post-TURP serum PSA in patients with BPH-LUTS in each evaluation on days 30, 60, and 90, and there was decrease in serum PSA in day 90 of observation. Post-TURP PSA depends on many factors; pre-operative PSA, pre-operative prostate volume, and the volume of resection of the prostate. The estimated decrease in post-TURP serum PSA can be assessed based on the parameters of the size of prostate resection volume. The low complication of erectile dysfunction is due to TURP.

REFERENCES

1. Fonseca RC, Gomes CM, Meireles EB, Freire GC, Srogi M. Prostate specific antigen level following transurethral resection of the prostate. Int Braz J Urol. 2008; 34(1): 41-8.

2. Brosman SA. Prostate specific antigen. Department of Urology University of California at Los Angeles Medical School. J Ca Cancer; 2009. Update April 27. http://www.emedicine.com

3. Chung BA, Hong SJ, Cho JS, Seong DH. Relationship between serum prostate specific antigen in prostatic volume in Korean men with benign prostatic hyperplasia. Multi Center Study. BJU Int. 2006; 98(4): 742-6.

4. Prasetyo RB, Soetojo. Profile BPH di RSU Dr. Soetomo Surabaya periode Januari-Desember 2005. Surabaya: Penelitian Retrospektif; 2006. p. 1-29.

5. Taher A. Erectile dysfunction after transurethral resection of the prostate: Incidence and risk factors. World J Urol. 2004; 22: 457-60.

6. Poulakis V, Nikolaos Ferakis, Ulrich Witzsch, Rachell de Vries, Eduard Becht. Erectile dysfunction after transurethral prostatectomy for lower urinary tract symptoms: Results from a center with over 500 patients. Asian J Androl. 2006; 8(1); 69-74.

7. McConnell, Abrahams P. Evaluation and treatment of LUTS in older men. In: Male Lower Urinary Tract Dysfunction Evaluation and Management. In 6th International Consultation on New Development in Prostate Cancer and Prostate disease; 2005.

8. Orihuelaabc E, Sangabc MP, Motamediabc M, Cowanabc DF, Warrenabc MM. Mechanism of healing of the human prostatic urethra following thermal injury. Urology. 1996; 48(4): 600-8.

9. Marks LS, Dorey FJ, Rhodes T, Shery ED, Rittenhouse H, Partin AW, et al. Serum prostate specific antigen level after transurethral resection of the prostate: Longitudinal characterization in men with benign prostatic hyperplasia. J Urol. 1996; 156: 1035-9.

10. Aus G, Berdgdahl S, Frosing R, lodding P, Pileblad E, Hugusson J. Reference range of prostate-specific antigen after transurethral resection of the prostate. J Urol 1996; 47: 529-31.

11. Lloyd SN, Collins GN, McKelvie GB, Hehir M, Rogers AC. Predicted and actual change in serum PSA following prostatectomy for BPH. Urology. 1994; 43: 472-9.

12. Roehrborn CG, McConnell JD. Etiology, pathophysiology, epidemiology, and natural history of benign prostatic hyperplasia. In: Walsh PC, Retik AB, Vaughan ED Jr, Wein A, editors Campbell's Urology. 8th ed. Philadelphia: Saunders; 2002. p. 1297-336.

13. Lawrentschuk N, Frydenberg Mark. Benign prostate disorders, directory of continuing medical education, Chapter 9. J Endocrine; 2009. Update September 30. http//www.endotext.com