

COMPARISON OF PREOPERATIVE VERSUS POSTOPERATIVE POST VOID RESIDUAL URINE VOLUME IN PELVIC ORGAN PROLAPSE

Gynaecology

Dr. Aravinda K V Venkataram K T

Junior Resident, Department of OBG, KVG Medical College, Sullia, Dakshina Kannada.

Dr. Geeta Jagannath Doppa*

Professor and HOD, Department of OBG, KVG Medical College, Sullia, Dakshina Kannada. *Corresponding Author

Dr. Ravikanth G O

Associate Professor, Department of OBG, KVG Medical College, Sullia, Dakshina Kannada.

ABSTRACT

Introduction: Post void residual urine is a key marker for the evaluation of the efficacy of bladder emptying particularly in women with pelvic organ prolapse. Objectives of the present study were to compare preoperative versus postoperative post void residual urine volume in patients with pelvic organ prolapse and to assess the role of vaginal hysterectomy with anterior colporrhaphy in relieving urinary disturbances. **Methods:** This study was done on 50 patients with pelvic organ prolapse admitted for vaginal hysterectomy with anterior colporrhaphy. Staging of the prolapse was done by POP-Q. Ultrasound measurements of post void residual urine volume was done preoperatively and at the time of discharge postoperatively. Post void residual urine volume of more than 50 mL was considered significant. **Results:** Preoperatively post void residual urine volume < 50 mL seen in 14 women and > 50 mL seen in 36 women respectively. After vaginal hysterectomy with anterior colporrhaphy postoperatively 48 women had post void residual urine volume < 50 mL and only 2 women had > 50 mL respectively, where the P value is < 0.001 which is statistically significant. **Conclusion:** Vaginal hysterectomy with anterior colporrhaphy will significantly reduce the post void residual urine volume thereby correcting the bladder dysfunction.

KEYWORDS

Pelvic organ prolapse, Post void residual urine Vaginal hysterectomy, Anterior Colporrhaphy

INTRODUCTION

Pelvic organ prolapse is a common condition that can produce numerous symptoms including urinary incontinence and other voiding dysfunctions because of distortion of lower urinary tract.^[1] Post void residual urine volume is the key marker for the efficacy of bladder emptying. Preoperative assessment of post void residual urine volume helps to know the voiding dysfunction. Where as postoperative measurement of post void residual urine volume helps to assess the correction of cystocele and to detect postoperative development of stress urinary incontinence.^[2]

In general a post void residual urine volume less than 20 mL to 25 mL is considered normal, while a volume of 50 mL to 100 mL is considered as adequate bladder emptying and a volume more than 100 mL warranting further investigation. A volume of 200 mL will be regarded as the upper limit tolerable for not inserting a catheter, but according to some experts it would be termed chronic urinary retention.^[3]

AIMS AND OBJECTIVES OF STUDY

To compare preoperative versus postoperative post void residual urine volume in pelvic organ prolapse patients undergoing vaginal hysterectomy with anterior colporrhaphy.

To assess the cystocele correction.

To study the correlation between post void residual urine volume and urinary symptoms associated with pelvic organ prolapse.

MATERIALS AND METHODS

The present study was a hospital based prospective observational study done for 18 months from 1st November 2018 to 30th April 2020 at KVG Medical College and Hospital, Sullia on all women having pelvic organ prolapse with cystocele who underwent vaginal hysterectomy with anterior colporrhaphy after obtaining a written informed consent. Patients were followed up during the hospital stay. Universal sample of 50 cases were taken into study and appropriate statistical methods proposed for the study was applied.

INCLUSION CRITERIA

All women with pelvic organ prolapse with cystocele who are undergoing vaginal hysterectomy and anterior colporrhaphy at KVG Medical College Sullia are taken into the study.

EXCLUSION CRITERIA

Women with previous pelvic surgeries like abdominoperineal

resection, proctocolectomy or total exenteration.
Associated structural bladder abnormalities.
Bladder injury during surgery.
Patients not willing to get involved in the study.

METHODOLOGY

The use of ultrasonography for evaluating bladder volume is quick, safe, noninvasive, painless and well accepted by patients. Several studies have used real time transabdominal ultrasonography as a possible alternative to assess the post void residual urine volume. Ultrasound assessment has the greatest ability to eliminate the source of error from urethral catheterization, particularly the diuresis factor.^[4, 5,6]

This study was done on 50 patients with different stages of pelvic organ prolapse admitted for vaginal hysterectomy with anterior colporrhaphy. Detailed history, thorough examination was done as per the predesigned proforma. Staging of prolapse was done by POP-Q. Ultrasound measurements of post void residual urine volume was done preoperatively and at the time of discharge postoperatively. Post void residual urine volume of more than 50 ml was considered significant in our study.

RESULTS

Age and duration of pelvic organ prolapse has shown significant relation with the raised post void residual urine volume. Age of the patients varied from 43 years to 92 years, with mean age of 67.5 years \pm 24.5 years. Out of 50 patients 41 patients were postmenopausal and the mean duration of menopause was 16 years. Duration of the pelvic organ prolapse was from 2 months to 10 years, with mean duration of 4.9 years \pm 5.1 years. Out of 50 patients 40 were of lower and 10 were of middle socio economic status according to modified Kuppuswamy classification.[Table:1,2]

Table1:DEMOGRAPHIC FEATURES IN RELATION TO PELVIC ORGAN PROLAPSE AND PVR

PARAMETERS	YEARS	POST VOID RESIDUAL URINE		TOTAL
		< 50 mL	> 50 mL	
DURATION OF PROLAPSE	< 1 YEAR	7	14	21
	1-5 YEARS	7	10	17
	6-10 YEARS	0	4	4
	> 10 YEARS	0	8	8
	TOTAL	14	36	50

DURATION OF MENOPAUSE	NOT ATTAINED	4	5	9
	≤ 5 YEARS	2	6	8
	6-10 YEARS	3	4	7
	11-15 YEARS	3	5	8
	16-20 YEARS	2	5	7
	> 20 YEARS	0	11	11
	TOTAL	14	36	50
PLACE OF DELIVERY	HOME	10	31	41
	HOSPITAL	4	5	9
	TOTAL	14	36	50
METHOD OF DELIVERY	NVD	13	36	49
	LSCS+VBAC	1	0	1
	TOTAL	14	36	50
PARITY	1 – 2	7	10	18
	3 – 4	7	19	25
	5 – 6	0	4	4
	7 – 8	0	3	3
	TOTAL	14	36	50
SOCIO ECONOMIC STATUS	LOWER CLASS	9	31	40
	MIDDLE CLASS	5	5	10
	TOTAL	14	36	50

Table 2 : ASSOCIATION AGE AND POST VOID RESIDUAL URINE VOLUME

Age Group	Post Void Residual Urine Volume		Total
	< 50 mL	> 50 mL	
43-52 YEARS	6	7	13
53-62 YEARS	5	7	12
63-72 YEARS	3	15	18
73-82 YEARS	0	6	6
83-92 YEARS	0	1	1
TOTAL	14	36	50

Lower Urinary Tract Symptoms associated with Pelvic Organ Prolapse include both storage and emptying symptoms. This study used standardised terminologies described by the International Continence Society, Standardisation Steering Committee during history taking to ensure an accurate characterization of the type of lower urinary tract symptoms experienced by each patient.^[7]

Storage symptoms include Increased frequency, Straining to void and Reduce to void. Increased frequency where micturition occurs more frequently than previously deemed normal, more than 7 times in waking hours or more than 2 to 3 times while in sleep at night. Straining to void describes the muscular effort used to initiate, maintain or improve the urinary stream. Reduce to void where unless the patient reduces the prolapse herself she will not be able to completely empty the bladder.^[7]

Emptying symptoms include Incomplete emptying, Stress urinary incontinence and Urge incontinence. Incomplete emptying is a subjective sensation or complaint of the individual that the bladder does not feel empty at the end of micturition. Stress urinary incontinence is the complaint of involuntary loss of urine on effort or physical exertion or sneezing or coughing. Urge incontinence is the sudden compelling desire to pass urine which is difficult to defer leading to involuntary loss of urine associated with urgency.^[7]

Storage symptoms were significantly associated with greater stages of prolapse. Out of 50 patients 13 had second stage, 31 had third stage and 6 had fourth stage pelvic organ prolapse according to POP-Q staging.[Table:3]

Table 3 : POP- Q Stages of Prolapse in Relation to Post Void Residual Urine Volume

POP-Q Staging	No of Patients	Pre Operative PVR		Post Operative PVR	
		< 50 mL	> 50 mL	< 50 mL	> 50 mL
First Stage	0	0	0	0	0
Second Stage	13	6	7	13	0
Third Stage	31	8	23	30	1
Fourth Stage	6	0	6	5	1

Total	50	14	36	48	2
-------	----	----	----	----	---

Incomplete emptying and Increased frequency was complained by 74% and 72% of patients; Reduce to void and Straining to void were present in 94% and 14% of patients; Stress urinary incontinence and Urge incontinence was complained by 10% and 6% of patients respectively and showed significant association with the stages of prolapse. Except stress urinary incontinence others were associated with raised post void residual urine volume.[Table:4;Figure:1,2]

Table 4 : Association Of Urinary Disturbances To Post Void Residual Urine Volume

Symptoms	Total	Pre Operative PVR		Post Operative PVR	
		< 50 mL	> 50 mL	< 50 mL	> 50 mL
REDUCE TO VOID (RV)	47	10	37	47	0
INCOMPLETE EMPTYING (IE)	37	10	27	37	0
INCREASED FREQUENCY (IF)	36	11	25	25	1
STRAINING TO VOID (SV)	7	0	7	6	1
STRESS INCONTINENCE (SI)	5	5	0	5	0
URGE INCONTINENCE (UR)	3	1	2	3	0

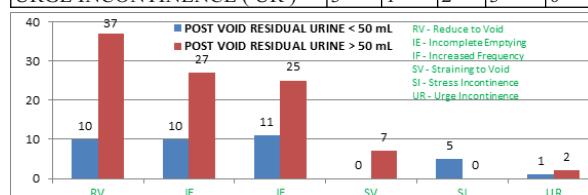


Figure 1: Preoperative Distribution Of Patients Having Bladder Dysfunction To PVR

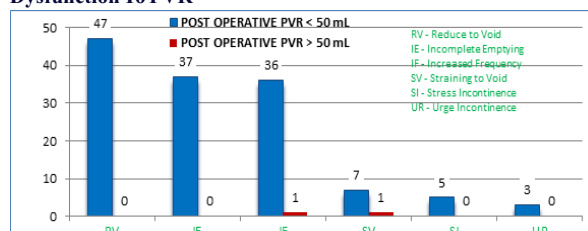


Figure 2: POSTOPERATIVE CORRECTION OF BLADDER DYSFUNCTION AND RAISED PVR

Preoperatively post void residual urine volume < 50 mL seen in 14 women and > 50 mL seen in 36 women respectively. After vaginal hysterectomy with anterior colporrhaphy postoperatively 48 women had post void residual urine volume < 50 mL and only 2 women had post void residual urine volume > 50 mL respectively, where the P value is < 0.001 which is highly statistically significant. [Table:5; Figure:3]

Table 5 : COMPARISON OF PREOPERATIVE VERSUS POSTOPERATIVE PVR

PAIRED T TEST	PVR	CASES	MEAN ± SD	P VALUE
PREOPERATIVE	< 50 mL	14	0.28±0.45	< 0.001
	> 50 mL	36	0.72±0.45	
POSTOPERATIVE	< 50 mL	48	0.96±0.19	< 0.001
	> 50 mL	2	0.04±0.19	

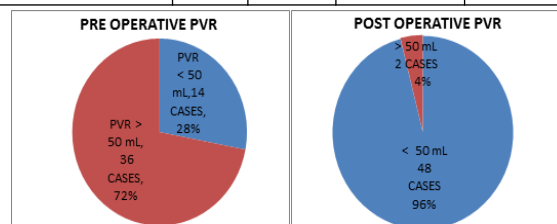


Figure 3: COMPARISON OF PRE OPERATIVE VERSUS POST OPERATIVE POST VOID RESIDUAL URINE VOLUME

DISCUSSION

The prevalence of PVR more than 100 mL is 10%. The elevated PVR is associated with increasing age and greater stages of prolapse. A PVR

volume of less than 50 mL is considered adequate bladder emptying.^[3] In our study out of 50 patients, preoperatively 14 had PVR < 50 mL and 36 had PVR > 50 mL. Incidence of Reduce to Void, Incomplete emptying, Increased frequency were highest followed by Straining to void, Stress urinary incontinence and Urge incontinence. As the stages of prolapse, duration of prolapse, duration since menopause increases the urinary dysfunction and PVR volume increases.

Out of 5 patients with stress urinary incontinence 2 patients underwent TOT mesh repair along with the surgery. Post operatively all 5 were relieved of SUI, which shows just vaginal hysterectomy with anterior colporrhaphy might work as anti incontinence surgery in many cases even in occult cases of SUI.^[8,9]

The majority of urinary dysfunction got relieved postoperatively, 48 patients had PVR of < 50 mL and only 2 patients had PVR of > 50 mL, which also slightly higher than 50 mL (First case 65 mL, Second case 74 mL) where no further intervention was done. This study shows the effectiveness of vaginal hysterectomy with anterior colporrhaphy in reducing raised post void residual urine volume. This study also shows that the mean age of the patient admitted for prolapse was 67.5 years, majority were multiparous with history of normal vaginal home deliveries and were of lower socio economic class.

COMPARISON

This study shows the elevated PVR was associated with increasing age and greater stages of prolapse which is consistent with the study done by Lukacz et al, Fitzgerald et al, and Shashikumar et al.^[10,11,12] Our study shows that significant relation between increasing parity, place of delivery, method of delivery and socio economic status which is in contrast to the study done by Lukacz et al and Lowenstein et al.^[10,13] In the latter study increasing parity, place of delivery, method of delivery and socio economic status were not associated with urinary dysfunction and raised PVR. Our study shows the significant reduction in the elevated PVR by the vaginal hysterectomy with anterior colporrhaphy (p value < 0.001) which is in correlation with the study done by Chidre et al and Stanton et al.^[14,15]

STRENGTHS AND LIMITATIONS

Strength of this study include its hospital based prospective design and use of ultrasonography to measure the PVR which is more reliable, quick, safe, noninvasive, painless and well accepted by the patients. Limitations of the study include small sample size and it has not measured the patients level of satisfaction or discomfort after the surgery.

CONCLUSION

Urinary disturbances are more commonly seen in pelvic organ prolapse and raised post void residual urine volume was significantly associated with increasing stages and duration of pelvic organ prolapse. In patients with pelvic organ prolapse vaginal hysterectomy with anterior colporrhaphy is an effective procedure in correcting urinary disturbances by reducing elevated post void residual urine volume.

REFERENCES

1. Narendra Malhotra; Pelvic organ prolapse In Jeffcoate's principles of gynecology 9th edition. Jaypee Brother medical publisher (P) Ltd. (2019) Page 327-347.
2. Jonathan S Berek; Pelvic organ prolapse In Berek and novak's gynecology 16th edition. Wolters Kluwer (India) Pvt Ltd, New Delhi. (2019) Page 736-764.
3. CK Tam I FHKCP, FHKAM (Medicine), KK Wong MB BS, MRCP (UK), WM Yip MB BS Prevalence of incomplete bladder emptying among elderly in convalescent wards: a pilot study Asian Journal of Gerontology & Geriatrics 2006;1; 66-71.
4. Walter Artibani and Maria A. Cerruto. The role of imaging in urinary incontinence. BJU International 2005;95:699-703.
5. Bernard T. Haylen & Joseph Lee The accuracy of post-void residual measurement in women Int Urogynecol J (2008) 19:603-606.
6. Accuracy of Bladder Scanning in the Assessment of Postvoid Residual Volume Ghadeer Al-Shaikh, MBBS, FRCSC, Annick Larochelle, MD, FRCSC, Craig E. Campbell, MD, FRCSC, Joyce Schachter, MD, FRCSC, Kevin Baker, MD, FRCSC, Dante Pascali, MD, FRCSC JUNE JOGC JUIN 2009; 526-532.
7. Abrams, P, Cardozo, L, Wagg, A, Wein, A. (Eds) Incontinence 6th Edition (2017). ICI-ICS. International Continence Society, Bristol UK, ISBN: 978-0956960733. Page 500-517.
8. Patel PD, Amrute KV, Badlani GH. Pathophysiology of pelvic organ prolapse and stress urinary incontinence. Indian J Urol 2006;22:310-6.
9. Ching-Chung Liang, M.D.1,2, Shuenn-Dhy Chang, M.D.1,2, Yao-Lung Chang, M.D.1,2, Ling-Hong Tseng, M.D.1,2, Tsia-Shu Lo, M.D.1,2, Yung-Kuei Soong, M.D.1,2 Postsurgical Urinary Incontinence in Continent Women undergoing Hysterectomy for Uterine Prolapse. Incont Pelvic Floor Dysfunct 2007;2:45-48.
10. Lukacz ES, DuHamel E, Menefee SA, Lubner KM. Elevated postvoid residual in women with pelvic floor disorders: prevalence and associated risk factors. Int Urogynecol J 2007; 18:397-400.
11. Fitzgerald MP, Jaffar J, Brubaker L. Risk Factors for an elevated postvoid residual urine volume in women with symptoms of urinary urgency, frequency and urge incontinence. Int Urogynecol J Pelvic Floor Dysfunction 2001;12(4):237-9.

12. Shashikumar NS, Dutta I. Preoperative and Postoperative Postvoid Residual Urine Volume in Urogenital Prolapse: A Comparative Study. J South Asian Feder Obst Gynaec 2017;9(2):86-88.
13. Lowenstein L, Anderson C, Kenton K, Dooley Y, Brubaker L. Obstructive voiding symptoms are not predictive of elevated postvoid residual urine volumes. International Urogynecology Journal. 2008 Jun 1;19(6):801-4.
14. Chidre VY, Deshpande A, Gandage RR. Comparison of Pre-Operative and Post-Operative Post Void Residual Urine Volume in Urogenital Prolapse. Ann. Int. Med. Den. Res. 2015;1(3):255-259.
15. STANTON SL, HILTON P, NORTON C, CARDOZO L. Clinical and urodynamic effects of anterior colporrhaphy and vaginal hysterectomy for prolapse with and without incontinence. BJOG: An International Journal of Obstetrics & Gynaecology. 1982 Jun;89(6):459-63.