

A Comparative Study of Urogenital Problems and Urodynamic changes in Postmenopausal Women with Natural Menopause and Surgical Menopause

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ABSTRACT

Noninvasive urodynamics (UDS) consists of tests [voiding diaries, flowmetry, postvoid residual estimation and pad tests], which do not require any patient manipulation. In contrast, invasive UDS warrants the insertion of catheters, transducers, and/or needle sets into the patients. While noninvasive tests are useful for screening or diagnosis, invasive tests are necessary to confirm the diagnosis and refine the findings. Urodynamic evaluation is a good predictor of outcomes after therapeutic intervention.

Keywords: Natural menopause, Surgical menopause, Urodynamics.

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INTRODUCTION

The female genital and lower urinary tracts share a common embryological origin, arising from the urogenital sinus. Both are sensitive to the effects of female sex steroid hormones. Estrogen deficiency occurring following the menopause is known to cause atrophic changes within the urogenital tract and is associated with urinary symptoms such as frequency, urgency, nocturia, incontinence and recurrent infection. It has been suggested that estrogen increases urethral closure pressure and improves pressure transmission to the proximal urethra, both promoting continence. Estrogen is known to have an effect on collagen metabolism in the genital tract.

Urodynamics as a tool for investigating function and dysfunction of urinary tract is gaining increasing importance and has become an established part of investigation for the lower urinary tract.

AIMS AND OBJECTIVES

1. To study the urogenital complaints and urodynamic changes in postmenopausal women after natural menopause.
2. To study the urogenital complaints and urodynamic changes in postmenopausal women after surgical menopause.
3. To compare the findings in above two groups.

MATERIALS AND METHODS

This comparative study of urogenital problems and urodynamic changes in postmenopausal women with natural menopause and surgical menopause was conducted in Department of Obstetrics and Gynecology and Urology Department of Surgery, SN Medical College and Hospital, Agra from November 2011 to October 2012.

Inclusion Criteria

- Sixty postmenopausal women with natural menopause with amenorrhea for more than 6 months with urogenital problems were selected for study as group I.
- Sixty women who underwent total abdominal hysterectomy with bilateral salpingo-oophorectomy and attained surgical menopause for more than 6 months were included in the study as group II.

Exclusion Criteria

Patients with central nervous system disorders (like dementia, multiple sclerosis, spinal cord injury, etc.), patients with malignancies located in the bladder, cervix and those that are most likely to spread to the autonomic system, such as lung and breast cancer. Patients on drugs like alpha blockers, anticholinergics, hypnotics and loop diuretics.

Methods

Preliminary examination included a detailed history, analysis of genitourinary symptoms, general examination, neurological examination, abdominal examination, local examination of genital organs, gynecological examination and digital rectal examination.

Patients were asked to keep a urinary diary, record frequency of voiding, time of micturition, time and type of incontinence and voided volume.

In clinical setting, 24 to 72 hours diaries were maintained by patients for the evaluation of lower urinary tract symptom. One hour peripheral artery disease test was done on patients, the International Continence Society (ICS) recommend a 1-hour test when the patient drinks 500 ml 15 minutes before the test and then asked to perform a number of set exercises. Specific investigations like measuring postvoid residual volume by ultrasound and vaginal cytology were done. Injection gentamycin 80 mg I/M was given on the same morning before the start of cystometry.

Following observations were made:

1. First bladder sensation
2. Maximum bladder capacity
3. Bladder compliance
4. Detrusor pressure
5. Uninhibited detrusor contraction
6. Any urine leakage and fall in pressure.

Observations in Uroflowmetry

1. Total voided volume
2. Peak flow rate
3. Voiding time (VT)
4. Residual volume (RV).

A detailed history was taken and clinical examination was made. The data obtained was analyzed statistically using χ^2 test and t-test.

The mean age in natural menopause was 55.6 ± 6.45 years and in surgical menopause was 53.9 ± 8.36 years (Table 1).

Among the genital symptoms the complaint of vaginal discharge was significantly more in surgical group ($p < 0.05$) (Table 2).

The most common urinary symptom complained in two groups was frequency of urination which was significantly more in surgical group. Among incontinence stress, incontinence was the most common and significantly higher in surgical group (Table 3).

Urge incontinence was found to be significantly higher in natural group. Rest of the urinary complaints were similar in two menopausal groups.

In natural menopause group, the mean total voided volume in natural group was 411 ± 69.29 ml. The mean total voided volume (TVV) in surgical group was $325 \pm$

92.7 ml. The difference in TVV in two groups was not significant. The mean peak flow rate in natural group was 22.13 ± 5.83 ml/sec. The mean peak flow rate (PFR) in surgical group was 18.42 ± 6.30 ml/sec. The difference in PFR in two groups was not significant (Tables 4 and 5).

The mean voiding time in natural group was 34.6 ± 10.9 and 38 ± 9.8 sec in surgical group. The difference in VT in two groups was not significant. The mean residual volume in natural and surgical group were 22.5 ± 12.9 and 35 ± 24.27 ml. The difference in RV in two groups was not significant.

The mean first bladder sensation in natural and surgical group were 156 ± 56 and 126 ± 44.58 ml. The difference in FBS in two groups was significant ($p < 0.05$). The mean maximum bladder capacity in natural and surgical group were 386 ± 105 and 390 ± 140 ml. The difference in mean bladder capacity (MBC) in two groups was not significant. The mean bladder compliance in natural and surgical group was 11.37 ± 4.04 ml/cm of water and 12.57 ± 5.87 ml/cm of water. The difference in bladder compliance (BC) in two groups was not significant. The mean detrusor pressure in natural and surgical menopause group was 30.5 ± 16 cm of water and 32.5 ± 17.4 cm of water. The difference in detrusor pressure (DP) in two groups was not significant. Uninhibited detrusor contraction was seen in 36.37% in natural menopause and 43.33% in surgical menopause. The difference in uninhibited detrusor contraction (UDC) in two groups was not significant.

DISCUSSION

Lower urinary tract symptoms are one of the most important health problems which not only cause considerable personal suffering for the individual affected but is also of immense economic importance for health services.

There is increased burden of surgical menopause in India. Significant number of hysterectomies with bilateral salpingo-oophorectomy are being done every year (2,310,263/one billion population of India) according to the National Woman Health Center, Centers for Disease Control (2007). According to Krishna and Anklesaria (1995), there is relatively higher percentage of Indian women presenting with genitourinary symptoms.

Table 1: Distribution of cases according to age

Age (in years)	Natural menopause		Surgical menopause	
	No. of cases	Percentage	No. of cases	Percentage
35-45	04	6.67	12	20
46-55	32	53.33	24	40
56-65	20	33.33	20	33.33
>66	4	6.67	4	6.67
Total	60	100	60	100

Table 2: Distribution of cases according to genital symptoms

S. no.	Genital symptoms	No. of cases			
		Natural menopause		Surgical menopause	
		No.	%	No.	%
1.	Dryness of vagina	16	26.67	22	36.67
2.	Pruritus	24	40	28	46.67
3.	Burning sensation	22	36.67	26	43.33
4.	Vaginal discharge	16	26.67	36	60.00
5.	Dyspareunia	16	26.67	22	36.67

Table 3: Distribution of cases according to urinary symptoms

S.no.	Urinary symptoms	No. of cases			
		Natural menopause		Surgical menopause	
		No.	%	No.	%
1.	Frequency	28	46.67	42	70
2.	Urgency	24	40	36	60
3.	Stress incontinence	12	20	24	40
4.	Dysuria	8	13.33	8	13.33
5.	Urge incontinence	12	20	2	3
6.	Mixed incontinence	4	6.67	14	23.33
7.	Sense of incomplete filling	12	20	18	30%
8.	Straining to void	4	6.67	6	10
9.	Hesitancy	4	6.67	8	13.37
10.	Intermittent stream	4	6.67	8	13.37
11.	Nocturia	22	36.67	26	43.33

Table 4: Natural menopause group I urodynamic findings

Uroflowmetry	35-45 years		46-55 years		56-65 years		>66 year	
	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Total voided volume	362-460	411 ± 69.29	240-490	361 ± 76.66	176-520	362 ± 105.12	156-460	223 ± 94.75
Peak flow rate	21-23	22 ± 1.41	13-32	22.8 ± 5.67	14-28	18.9 ± 4.74	9-25	20 ± 1.41
Voiding time	26-34	30 ± 5.65	30-58	39 ± 7.76	26-56	34.6 ± 10.9	23-37	20 ± 9.89
Residual volume	0-10	5 ± 7	0-35	17.81 ± 12.3	10-45	23.5 ± 22.9	10-75	45 ± 30
<i>Cystometry findings</i>								
First bladder sensation	156-210	183 ± 38	100-250	161 ± 41	87-220	170 ± 52	80-220	90 ± 74
Maximum bladder capacity	367-520	443 ± 108	300-600	386 ± 98	260-600	393 ± 105	200-590	248 ± 101
Bladder compliance	12-14.6	13.6 ± 1.83	9-18	13.37 ± 3.24	8-20	13.9 ± 4.01	5-12	8.5 ± 4.94
Distribution of detrusor pressure	11-14	12.5 ± 2.21	11-52	30.5 ± 15	11-57	25.9 ± 13.49	16-47	31.5 ± 21.92
Uninhibited detrusor contraction	Present in 36.67% of total cases	—	—	—	—	—	—	—

Table 5: Surgical menopause group II urodynamic findings

Uroflowmetry	35-45 years		46-55 years		56-65 years		>66 years	
	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Total voided volume	210-480	443 ± 52.33	165-547	325 ± 92.74	148-490	329 ± 114.7	170-470	231 ± 86.27
Peak flow rate	16-32	17 ± 4.41	12-24	22.4 ± 6.30	9-22	17.9 ± 6.54	5-20	18.5 ± 4.95
Voiding time	36-48	39 ± 5.24	28-52	39.93 ± 9.15	26-72	39.8 ± 14.17	24-38	31 ± 9.89
Residual volume	0-35	5 ± 15	25-35	42.5 ± 23.5	25-105	53.5 ± 24.22	20-95	32.5 ± 176.7
<i>Cystometry findings</i>								
First bladder sensation	102-200	195 ± 27.07	70-280	144 ± 48.65	23-169	111 ± 44.58	37-140	89 ± 74.25
Maximum bladder capacity	324-600	580 ± 28.28	163-640	387 ± 101.16	123-500	390 ± 140.04	183-360	274 ± 121.68
Bladder compliance	10-15.6	14.3 ± 1.83	9-20	14.68 ± 3.57	4-30	11.8 ± 6.91	4-11	7.5 ± 4.95
Distribution of detrusor pressure	12-40	16 ± 13.74	11-60	32.5 ± 17.7	10-58	35.1 ± 19.68	14-42	28 ± 19.79
Uninhibited detrusor contraction	Present in 43.33% of total cases	—	—	—	—	—	—	—

The present study was a cross-sectional study which was done to compare urogenital problems and urodynamic changes in postmenopausal women with natural and surgical menopause.

The mean age in natural menopause was 55.6 ± 6.45 years and in surgical menopause was (53.9 ± 8.36) years similar to study done by Ostergard¹ where mean age was 59.3 years. In our study, no significant difference was observed in the age between natural and surgical menopause.

The distribution of genital symptoms (dryness of vagina, pruritus, burning sensation, vaginal discharge, dyspareunia, etc.) in both groups showed statistically significance with vaginal discharge which was complained by 26.67% in natural group and 60% in surgical menopause ($p < 0.05$). Other symptoms were more prevalent in surgical menopause but there was no significant difference. Frequency was the most common symptom observed in both the groups: 46.67% in natural menopause and 70% in surgical

menopause. There was significant difference ($p < 0.05$) between both groups. Similar to study done by Wyman et al² 42% in natural group and 61% in surgical group. Study done by Zhang et al³ shows 26% in natural group and 48% in surgical group.

Incontinence which was one of the most debilitating symptoms was present in 46.67% in natural menopause and 66.67% in surgical menopause which was not statistically significant. Similar to the study done by Magdalena et al⁴ which shows 60% in surgical menopause.

Among incontinence, stress incontinence was most common in both groups which was 20% in natural group and 40% in surgical group and there was statistically significant difference ($p < 0.05$). Similar to study done by Morgan et al.⁵

Mixed incontinence was seen in 6.67% in natural menopause and 23.33% in surgical menopause and there was statistically significant difference ($p < 0.05$). Study done by Diokno et al,⁶ and Botleno et al⁷ shows surgical menopause to be associated with mixed incontinence.

Urge incontinence was seen in 20% in natural menopause and 3.33% in surgical menopause, showing statistical significance in natural menopause.

Voiding dysfunction like sense of incomplete filling, straining to void, hesitancy, intermittent stream was more prevalent in surgical group, but there was no statistically significant difference between both the groups.

Urodynamic Profile

These mean total voided volume in natural menopause was 356 ± 114.75 and 325 ± 92.7 ml in surgical menopause, there was not statistically significant difference in both the groups. TVV was less in detrusor overactivity and voiding dysfunction and normal in stress incontinence and mixed incontinence, similar to study done by Haylen et al.⁸

The mean peak flow rate in natural menopause was 22.14 ± 5.83 ml/sec and in surgical menopause 18.42 ± 6.30 ml/sec. Though the PFR of surgical group was less, the difference between both groups was not significant. In our study, Q max was less than 15 ml/sec in voiding dysfunction, in stress incontinence it was normal and, in detrusor overactivity, it was supranormal (Hann Chorng Kuo 2007).⁹

The mean voiding time in natural and surgical group was 34.6 ± 10.9 and 38 ± 9.8 ml/sec. Though mean Vt (voiding time) was more in surgical group, there was no statistically significant difference between the two groups. Vt was more in voiding dysfunction.

Though the mean residual volume was more in surgical group there was no statistical significance. In our study, increase in residual volume was associated with surgical menopause and voiding dysfunction. Study done by Haylen

et al⁸ showed that high residual volume was associated with prior hysterectomy, major degree of prolapse and voiding difficulties.

The mean first bladder sensation in natural menopause was 156 ± 56 and 126 ± 44.58 ml in surgical menopause and there was statistically significant difference in both groups ($p < 0.05$), similar to the study done by Kalmeli et al.¹⁰ In patients with urgency and urge incontinence first bladder sensation (FBS) was less than 100 ml in both the groups. Uninhibited detrusor contractions were also seen in these patients. Thus, there was a definite relationship between increased bladder sensation and uninhibited detrusor contractions.

The mean maximum bladder capacity in natural menopause was 386 ± 105 ml and in surgical menopause it was 390 ± 140 ml. There was no statistically significant difference. A significantly lower bladder capacity was observed in patients with uninhibited detrusor contraction. The difference in mean bladder capacities between those cases with or without uninhibited detrusor contractions was significant similar to study done by Pons et al¹¹ and Diokno et al⁶ who reported that mean bladder capacity with uninhibited bladder contractions was significantly lesser than those without uninhibited bladder contractions.

There was no significant difference in bladder compliance in natural and surgical menopause group 11.37 ± 4.04 ml/cm of water and 12.57 ± 5.87 ml/cm of water. Compliance was poor in patients with urge incontinence in both the groups.

The mean detrusor pressure in natural menopause was 30.5 ± 16 cm of water and 32.5 ± 17.4 cm of water in surgical menopause. The difference was not statistically significant. There was increase in detrusor pressure in detrusor overactivity which was statistically significant.

Uninhibited detrusor contraction was seen in 26.67% in natural menopause and 43.33% in surgical menopause which was not statistically significant. Uninhibited detrusor contraction was independent of both the groups.

CONCLUSION

The physiological effects of the decline in circulating estrogen, combined with aging process, put postmenopausal women at risks of urogynecological dysfunction. The understanding of urodynamics can be used to provide good care to postmenopausal women with positive impact on their quality of life. Urodynamic evaluation is an interactive process intended to reproduce the patients symptoms and, that by appropriate measurements and observations, a correct diagnosis can be obtained in majority of patients. The interpretation of the urodynamic study should be combined with overall clinical picture.

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