Research Article

Clinical evaluation and urodynamic study observation in post-menopausal female: a comparative study

Atul K. Khandelwal^{1*}, Shivani Khandelwal², Vijoy Kumar³, Mahendra Singh³

¹Department of Urology, BPS Govt. Medical College, Khanpur Kalan, Sonapat, Haryana, India

²Department of Obstetrics & Gynaecology, BPS Govt. Medical College, Khanpur Kalan, Sonapat, Haryana, India

³Department of Urology, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India

Received: 08 February 2016

Accepted: 11 February 2016

*Correspondence:

Dr. Atul K. Khandelwal,

E-mail: dratulkhandelwal@yahoo.com

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ABSTRACT

Background: Menopause is an irreversible and age related phenomenon and serves as an objective sign of reproductive senescence. Atrophic changes within the urogenital tract may occur due to estrogen deficiency and is associated with genitourinary symptoms.

Methods: A total of 66 women who attained natural and surgical menopause with more than twelve months with urogenital symptoms were selected for study.

Results: Age of patients selected for study was between 35-70 years. Majority of the patients 52/66 (78.7%) were presented after minimum 5 yrs of menopause. Among genital symptoms vaginal discharge was significantly higher ($p < 0.05$) in surgical group 46.87% (15/32) in comparison to 26.4% (9/34) natural menopause group. Other symptoms were more frequent in surgical menopause ($p > 0.05$). Among urinary symptoms frequency was the most common symptom in both the groups, 15 (44.12%) in natural menopause and 22 (68.75%) in surgical menopause, more prevalent in surgical group. Urgency was seen in 38.23% in natural menopause and 56.25% in surgical menopause. Incontinence was present in 47.05% in natural menopause and 62.51% in surgical menopause. Among incontinence stress incontinence was most common in the groups, 20.59% in natural group and 37.5 % in surgical group, statistically significant in surgical group. Mixed incontinence was observed in 5.58% in natural menopause; statistically significant in surgical group. Prevalence of urge incontinence was observed more in natural menopause 20.59% and 3.12 % in surgical menopause. There was no statistically significant difference in uroflowmetry parameters between both the groups. In cystometry parameters, volume at first bladder sensation was significantly less in patients with urgency and urge incontinence in both groups. Maximum bladder capacity was less in detrusor overactivity in both the groups. Compliance was poor in patient with urge incontinence in both the groups.

Conclusions: Hypoestrogenism could be an etiological factor in urogenital dysfunction in postmenopausal women with spontaneous menopause and surgical menopause.

Keywords: Menopause, Natural, Surgical

INTRODUCTION

The lower urinary tract and female genital tract are arising from urogenital sinus. Both share a common embryologic origin and are sensitive to the effect of female steroid hormones.^{1,2} It has been suggested that estrogen increases urethral closure pressure and improve

pressure transmission to the proximal urethra, both promoting continence.³ Atrophic changes may be caused by estrogen deficiency occurring after menopause. Important physiological and endocrinological changes occur due to ageing of ovary noticed around menopause and ultimately depletion of hormone level. Surgical menopause refers to indirect menopause caused by

surgical removal of both ovaries in a woman who is still menstruating. Surgical procedure that could include bilateral oophorectomy includes hysterectomy, abdominoperineal resection and total pelvic exenteration with oophorectomy. In surgical menopause the physiological and endocrinal changes associated occur quickly as woman does not get a chance for gradual transition and it has a significant impact on women's quality of life and longevity. Urodynamics as a tool is gaining increasing importance and clinical urodynamic evaluation has become an established part of investigation for the lower urinary tract.

Aims and objectives

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

METHODS

This study was conducted in urodynamic laboratory in the department of Urology in Indira Gandhi Institute of Medical Sciences, Patna over a period of two years of December 2010 to December 2012. Ethical committee approval was obtained before conducting study. A total of sixty six patients were selected from out patients department (OPD) of Urology, Obstetrics & Gynecology and Reproductive Biology.

Inclusion criteria

Patients who attained natural menopause for more than 12 months with lower urinary tract symptoms and genital symptoms were selected for the study.

Patient who attained surgical menopause for more than 12 months with lower urinary tract symptoms and genital symptoms were selected for the study.

Exclusion criteria

It include brain and spinal cord disease, diabetes mellitus, malignancy of urogenital tract, patients on drug like α -blockers, anticholinergic agents, hypnotics, loop diuretics, hypothyroidism, grade 3 uterovaginal prolapse and urinary tract infection.

A detailed history, analysis of genitourinary symptoms, general examination, and neurological examination, and abdominal examination, local examination of genitalia, gynaecological examination and digital rectal examinations were done. Patients were asked to keep a voiding diary recording frequency of voiding, time of micturition, time and type of incontinence and voided volume. In the clinical setting 24 to 72 hours diary are adequate for evaluation for lower urinary tract symptoms. Pad test was done in patients presented with

incontinence. Patients were investigated for routine blood tests, complete urine examination, urine culture and sensitivity, blood urea, blood sugar, serum creatinine. Ultrasonography was done for post void residual urine. Uroflowmetry and urodynamic study were done in department of Urology. Informed consent was obtained from all patients before considering them for study.

Following urodynamic parameters were observed:

1. Post void residual volume.
2. Uroflowmetry- peak flow rate, average flow rate.
3. First bladder Sensation.
4. Maximum cystometric capacity.
5. Compliance.
6. Detrusor Overactivity
7. Any urinary leakage and fall in pressure statistical analysis of the test and outcome was measured by chi square test and t-test, using SPSS software.

RESULTS

Table 1: Distribution of number of cases.

Age in years	Natural menopause		Surgical menopause	
	No. of cases	%	No. of cases	%
35-45	3	11.11	6	18.75
46-55	17	44.44	13	50
56-65	11	33.33	11	18.75
>66	3	11.11	2	12.5
Total	34		32	

Mean age of presentation of symptoms in natural menopause group was 54.64 ± 7.0 years and in surgical menopause group was 50.59 ± 7.57 years (Table 1). 91.17% of the patients with natural menopause presented after 5 years of menopause while in surgical group 34.37% presented within 5 years of menopause (Table 2). Among genital symptoms vaginal discharge was significantly higher ($p < 0.05$) in surgical group 46.87% (15/32) in comparison to 26.4% (9/34) natural menopause group. Other symptoms were more frequent in surgical menopause but no statistical significance was observed. Atrophic vaginitis was seen in 20 patients with natural menopause and 21 in surgical menopause. Levator tone was weak in 18 patients in natural menopause group and 12 patients in surgical menopause group. Weak levator tone was seen in patients with stress incontinence in both the groups (Table 3). Among urinary symptoms frequency was the most common symptom in both the groups, 15 (44.12%) in natural menopause and 22 (68.75%) in surgical menopause, more prevalent in surgical group. Among incontinence stress incontinence was most common in the groups, 20.59% in natural group and 37.5 % in surgical group, statistically significant in surgical group. Prevalence of urge incontinence was observed more in natural menopause 20.59% and 3.12 % in surgical menopause (Table 4, 5). Other urinary symptoms like sense of incomplete filling, straining to

void, hesitancy, and intermittent stream was more prevalent in surgical menopause but was not clinically significant.

Table 2: Duration since onset of menopause.

Years following menopause	Natural menopause		Surgical menopause	
	No. of patients	%	No. of patients	%
1-5	3	8.82	11	34.37
6-10	20	58.82	12	37.5
>10	11	32.35	9	28.12

Table 3: Distribution of genital symptoms and clinical findings.

Genital symptoms and clinical findings	No. of cases			
	Natural menopause		Surgical menopause	
	No.	%	No.	%
Dryness of vagina	9	26.47	12	37.5
Pruritus	13	38.23	15	46.875
Burning sensation	12	35.29	14	43.75
Vaginal discharge	9	26.47	15	46.875
Dyspareunia	9	26.47	12	37.5
Atrophic vaginitis	20	58.82	21	65.56
Weak levator tone	18	52.94	12	37.5

Table 4: Urinary symptoms.

S. No.	Urinary symptoms	Natural menopause		Surgical menopause	
		No. of cases	%	No. of cases	%
1.	Frequency	15	44.12	22	68.75
2.	Urgency	13	38.23	18	56.25
3.	Nocturia	12	35.29	13	40.62
4.	Dysuria	5	14.71	5	15.62
5.	Straining to void	2	5.88	3	9.37
6.	Hesitancy	2	5.88	4	12.5
7.	Intermittent stream	2	5.88	4	12.5
8.	Sense of incomplete emptying	7	20.59	9	28.12
9.	Incontinence	16	47.05	20	62.5

Table 5 Distribution of incontinence in natural and surgical menopause.

Incontinence	No. of pt	%	No. of pt	%
Stress incontinence	7	20.59	12	37.5
Urge incontinence	7	20.59	1	3.125
Mixed incontinence	2	5.88	7	21.875
Total	16	47.05	20	62.5

Table 6: Uroflowmetry parameter in natural menopause.

	35-45yrs		46-55yrs		56-65yrs		≥66yrs	
	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Total voided volume	236-390	332±83.74	166-490	325.35±82.27	160-421	276.09±109.13	156-380	292±119.47
Peak flow rate	21-23	22±1.0	16-28	20.89±3.24	14-28	19.45±4.30	12-26	20±7.2
Average flow rate	14-16	14.67±1.15	8.1-18	13.625±2.89	12-18	13.21±3.03	8-16	14±5.29
Residual volume	0-10	6.66±5.77	10-90	21.94±21.18	10-40	19.36±9.29	10-30	20±10

Table 7: Uroflowmetry parameter in surgical menopause.

	35-45yrs		46-55yrs		56-65yrs		≥66yrs	
	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Total voided volume	210-480	331.17±83.17	160-468	326.31±115.99	167-352	261.73±61.10	170-470	320±212.13
Peak flow rate	18-24	20±2.52	14-24	19.05±3.01	12-20	18.4±2.57	16-20	18.37±2.83
Average flow rate	10-20	14±3.63	10-18	13.23±2.49	10-18	12.36±2.66	10-16	13±4.24
Residual volume	0-30	15±10.08	10-60	24±16.49	10-98	29.72±21.05	5-20	12.5±10.61

Table 8: Cystometry parameter in natural menopause.

	35-45yrs		46-55yrs		56-65yrs		≥66yrs	
	Range	Mean	Range	Mean	Range	Mean	Range	Mean
First bladder sensation(ml)	100-210	163.32±56.86	90-206	163.29±50.82	88-175	136.45±35.11	56-120	85.33±32.33
Maximum bladder capacity(ml)	320-520	440±105.83	225-560	421.41±107.90	176-480	315.18±108.14	210-404	316.67±105.11
Compliance (ml/cm of water)	12-14.6	13.2±1.31	9-69	25.41±17.01	13-57	29.81±15.29	11-47	24.67±6.50

Table 9: Cystometry parameter in surgical menopause.

	35-45yrs		46-55yrs		56-65yrs		≥66yrs	
	Range	Mean	Range	Mean	Range	Mean	Range	Mean
First bladder sensation(ml)	102-180	151.33±56.86	82-167	126.23±33.60	50-180	121.23±41.59	80-140	110±342.42
Maximum bladder capacity(ml)	232-520	421.33±102.33	180-490	376.38±110.14	260-450	345.09±64.93	240-360	300±84.85
Compliance (ml/cm of water)	8-15	11.5±2.66	11-48	25±13.68	11-40	26.90±12.30	14-42	28±19.79

As such there was no statistically significant difference in uroflowmetry parameters between both the groups. Total voided volume was less in urge incontinence and voiding dysfunction. Peak flow rate was less than 15ml/sec in voiding dysfunction. Increased residual volume was associated with surgical menopause and voiding difficulties (Table 6, 7).

The mean first bladder sensation in natural and surgical groups was 147.73±49.28 and 128.40±36.50 ml. ($p<0.05$) The mean bladder capacity in natural and surgical groups was 379.44±116.24 and 369.28±95.08 respectively. ($p>0.05$) The mean bladder compliance in natural was 12.39±5.26 ml/cm of H₂O and in surgical group was 13.28±4.10 ml/cm of H₂O. ($p>0.05$) (Table 8, 9) Detrusor overactivity was seen in 35.29% in natural menopause and 43.75 % in surgical menopause. ($p>0.05$) (Table 10).

Table 10: Distribution of uninhibited detrusor contraction in natural menopause and surgical menopause.

Group	Detrusor over activity	
	No. of cases	Percentage
Natural menopause	12	35.29
Surgical menopause	14	43.75

DISCUSSION

The present study was a prospective study which was done to compare urogenital symptoms and urodynamic

observation in postmenopausal women with natural and surgical menopause. Dhillon et al reported mean age 49±3.4 years for natural menopause.⁴ In our study the mean age at presentation of urogenital symptoms in natural menopause and surgical menopause group was 54.64±7.0 and 50.59±7.57 years respectively. No statistical significance was observed in the age at presentation between spontaneous and surgical menopause. Ho-Hsuing Lin et al showed highest prevalence of symptoms among 40-60 years age group.⁵ In our study most patients were in the age group of 45-65 years (75-80%). Henlay et al and Mundy have observed appearance/worsening of urinary symptoms in patients after hysterectomy. Present study observed postmenopausal urogenital symptoms in 11/32 (34.37%) in surgical group and on contrary only 3/34 (8.82%) in natural menopause group who presented within 5 years of menopause. Probably surgical interference leading to alteration in pelvic floor anatomy and neurological damage has some role to play in early presentation of urinary symptoms in surgical menopause group.

Our study included postmenopausal patients presenting with genital symptoms dryness of vagina, pruritus, burning sensation, vaginal discharge and dyspareunia. Vaginal discharge was complained by 26.47% in natural group and 46.87% in surgical menopause. ($p<0.05$) Other symptoms were more frequent in surgical menopause but no statistical significance difference was observed.

Sobhgol reported pelvic muscle strength was a predictor of stress incontinence.⁶ Weak levator tone accompanied

by mucosal changes due to atrophic vaginitis certainly has a role to play in high incidence of various types of urinary incontinence observed in the postmenopausal women. Atrophic vaginitis was observed in 20 of 34 patients in natural menopause and 21 of 32 in surgical menopause. Levator tone was weak in 18/34 patients in natural menopause and 12/32 in surgical group. Levator tone was weak in most of the patients with stress incontinence.

Incontinence which was the most debilitating symptom was present in 34.8% in natural menopause in the study done by Magdalena et al Brown et al showed 60% in surgical menopause.⁷ In our study incontinence was present 47.5% in natural menopause and 62.51% in surgical menopause ($p>0.05$).

The mean flow rate in natural menopause was 13.72 ± 2.96 ml/s and in surgical menopause 13.06 ± 2.78 ml/s. The mean flow rate in surgical menopause was lower than the mean flow rate in natural menopause but the difference was not statistically significant ($p>0.05$).

In our study both PFR and MFR was decreased in voiding dysfunction similar to study done by Haylen.⁸

The mean residual volume in natural menopause was 19.58 ± 15.88 ml and in surgical menopause was 23.56 ± 19.93 ml though mean residual volume was more in surgical group there was no statistically significance. In our study increased residual volume was associated with surgical menopause and voiding dysfunction. B. T. Haylen showed that high residual volume was associated with prior hysterectomy and voiding difficulties.

The mean maximum bladder capacity in natural menopause was 379 ± 105 ml and 369 ± 95.08 ml in surgical menopause. There was no statistically significant difference between both groups. A significantly lower bladder capacity was observed in patients with uninhibited detrusor contractions. Diokno et al also reported that mean bladder capacity with uninhibited bladder contractions was significantly lesser than those without uninhibited bladder contraction.⁹

In our study the mean bladder compliance in natural menopause was 12.39 ± 5.26 ml/cm of H_2O and 13.28 ± 4.10 ml/cm of H_2O , there was no statistically significant difference between both the groups. Compliance was poor in patients with urge incontinence.

CONCLUSION

The present study suggests that hypoestrogenism could be an etiological factor in urogenital dysfunction in postmenopausal women with spontaneous menopause and surgical menopause. In surgical menopause, the

physiologic changes associated with menopause occur quickly and significant impact on a woman's life. Further, prospective studies with larger number of patients with multicenter experience will be required to validate these results.

ACKNOWLEDGEMENT

I am highly thankful to my patient enrolled in this study, and to all my paramedical staffs which work hard in collecting the data for this study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Khandelwal AK, Khandelwal S, Kumar V, Singh M. Clinical evaluation and urodynamic study observation in post-menopausal female: a comparative study. *Int Surg J* 2016;3:763-7.