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Assessment of the Effect of Vulvovaginal Atrophy on Female Sexual Function Index among Postmenopausal Women Attending Suez Canal University

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Abstract:

Background: **Vulvovaginal atrophy is chronic, progressive with age and with hormonal deprivation, which is associated mainly with low estrogens with menopause, but also a slight decline of androgen with age. Vulvovaginal atrophy impacts most before- and after-menopausal women, with rates of prevalence between thirty-six percent and almost ninety percent, as indicated by the latest surveys.** ***Aim:*** **To improve the female sexual function index in postmenopausal women suffering from Vulvovaginal atrophy attending Suez Canal University Hospitals.** ***Subjects and Methods:*** **Postmenopausal women recruited from the outpatient clinic of the obstetrics and gynecology department, Suez Canal university hospital. Patients were subjected to history, examination, to diagnose vulvovaginal atrophy. Vulvovaginal atrophy was screened by interviewing ladies by using vulvovaginal screening questionnaire. This questionnaire includes 14 questions followed by gynecological examination to confirm the vulvovaginal atrophy diagnosis female Sexual Function was assessed through questionnaire. This questionnaire measured the sexual activity through 19 questions divided upon 6 domains: Desire, arousal, lubrication, orgasm, satisfaction, and pain.** ***Results:*** **we found that most of the participants had severe vaginal dryness (41.2%), decreased vaginal lubrication (68.9%) and urinary urgency (89%). On the other hand, the participants who had moderate vaginal discharge were 67.9%, dyspareunia 68%, dysuria was 51.9%, urinary frequency 55.7%, decreased arousal 44.3%, we found that most prevalent vulvovaginal atrophy sign was decreased moisture 94.7%, followed by abnormal discharge 40.3%.we found that participants without severe symptoms had significantly highest arousal score mean±SD (2.63±0.82) and lowest pain score mean±SD (3.95±1.01) than participants with severe symptoms with p value of <0.001 and 0.011, respectively.** ***Conclusion:*** **The female sexual function is less likely to be affected in the presence of moderate to severe VVA symptoms**

Keywords: ***Vulvovaginal Atrophy, Female Sexual Function Index, Postmenopausal***.

Introduction

Vulvovaginal atrophy (VVA) is a frequent illness that affects women after menopause. It is defined by a weakening of the vaginal epithelium and a reduction in cervical secretions, which are most directly associated to changes in estrogen levels [(1)].

VVA is chronic, progressive with age and with hormonal deprivation, which is associated mainly with low estrogens with menopause, but also a slight decline of androgen with age [(2)].

Vulvovaginal atrophy, urogenital atrophy, and atrophic vaginitis are all included in the recently renamed genitourinary syndrome

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of menopause, which was formerly known as VVA of post menopause. When the levels of estrogen in the plasma decrease, the mucosa that is rich in estrogen receptors and the bladder epithelium of the lower genital and urinary tracts undergo morphological and functional alterations [3].

When a woman enters post-menopause, the vagina undergoes a number of changes due to the transition to a hypoestrogenic environment. The vaginal epithelium changes from glandular to squamous and stratified, the vaginal wall becomes thinner and less elastic, blood flow decreases, and changes in the vaginal flora lead to vaginal dryness, which is the most common symptom of VVA [4].

In addition, urinary symptoms include increased frequency, urgency, dysuria, and recurrent urinary tract infections. Urinary incontinence is also a symptom, and it is mostly caused by pelvic floor relaxation [2].

In addition, these preceding alterations, together with itching, irritation, and dyspareunia, are the main causes of sexual dysfunction, which is described as a disorder of sexual desire, arousal, or orgasm, and/or dyspareunia. [5].

There is a shortage of research that investigates the impact of VVA on the sexual function of postmenopausal women in Ismailia government, despite the fact that VVA has been shown to have significant negative effects on sexual function in this population.

Therefore, this study was conducted to estimate the impact of VVA on sexual function among postmenopausal women attending Suez Canal University Hospitals.

Subjects and Methods

This is an analytic cross-sectional study of 318 sexually active married postmenopausal women aged 45 years or older who were recruited from the outpatient clinic of the obstetrics and gynecology department at Suez Canal University Hospitals. Women were recruited between November 2022 and April 2024, and those who had diabetes mellitus or were receiving chemotherapy or hormonal replacement therapy were excluded from the study. The research ethics committee of the Faculty of Medicine at Suez Canal University has authorized the study (5326), and all individuals were given informed consent to participate. The patient's weight, height, and body mass index (BMI) were measured.

Vulvovaginal atrophy diagnosed by history, physical examination and self-reporting screening questionnaire [5]. The data regarding the VVA and its effect upon the quality of life was collected upon 2 stages:

Stage (1):

All recruited women were inquired about basic characteristics which includes:

History taking:

-Personal data: Age – residence – occupation- marital state –education.

-Present history:

A) VVA symptoms:

VVA was screened by interviewing ladies by using vulvovaginal screening questionnaire. This questionnaire include 14 questions divided into vaginal, valvular and urinary symptoms. Furthermore, each of the previous questions had a scale (absent, mild, moderate & sever) Scored from 0 to 3 respectively [5]. The presence of ≥1 of these symptoms in the past 4 weeks indicates VVA.

This procedure assigned a severity score for each group of symptoms. For the purpose of classification of participants, the following scores were considered as threshold values for severe symptomatology: >11 for the group of

vaginal symptoms, >5 for vulvar symptoms, and >8 for urinary symptoms.

Following this assessment, a gynecological examination was carried out to confirm the VVA diagnosis. General and local examination was done to exclude chronic illness and to confirm the VVA diagnosis

Stage (2):

Questionnaire:

Female Sexual Function Index (Appendix II):

This questionnaire measured the sexual activity through 19 questions divided upon 6 domains: Desire, arousal, lubrication, orgasm, satisfaction, and pain. Each question has a response scale of 0 to 5. Individual domain scores were obtained by adding the scores of the individual items that comprise the domain and multiplying the sum by the domain factor. The full scale score was 36 obtained by adding the six domain scores. It should be noted that within the individual domains which ranging from (0-5), a domain score of zero indicates that no sexual activity was reported during the past month [6]. The validated Arabic version was used for data collection [7].

Statistical Analysis

The Statistical Package for Social Science (SPSS) version 25 was used to conduct all of the statistical analyses. Descriptive statistics were used in numerical form (mean, SD, or percentages) to characterize the quantitative variables. Tables were used to show the data. Qualitative data was presented as numbers and percentages, whereas quantitative data was given as mean ± standard deviation or median(IQR). The ANOVA was used for quantitative variables that were normally distributed, whereas Qualitative factors were analyzed using the chi-square test. A P value of less than 0.05 was deemed statistically significant.

Results

This study participants had mean age of the participants was 54.26 years (±4.35), majority of them (70.4%) with age ranged from 50 to 59 years old, lived in urban areas 172(54.1%) and housewives178 (56%) with middle economic status235 (73.9%). The mean weight was 84.60 kg, while the mean height was 160.19 cm. Finally, the mean BMI was 32.98 as showed in Table 1.

Table 2 showed that most of the participants had severe vaginal dryness 131(41.2%), decreased vaginal lubrication 219 (68.9%) and urinary urgency 283 (89%). On the other hand, the participants who had moderate vaginal discharge were 216(67.9%), dyspareunia was 218 (68%), dysuria was 165(51.9%), urinary frequency was 177 (55.7%), decreased arousal was141(44.3%), and recurrent UTI was 267 (84%). The rest of the symptoms ranged from absent to mild among the rest of the participants.

In table 3, vaginal symptoms severity score was median(IQR) 8.75 (3.08), vulvar symptoms severity score was median(IQR) 5.02 (1.82) and urinary symptoms severity score was median(IQR) 9.12 (2.46).

The most prevalent VVA sign among the patients was the decreased moisture 301(94%), followed by the presence of abnormal discharge128 (40.3%) (Table 4).

Table 1: Demographic characteristics and baseline measurements of the study participants		
Characteristics	N=318	
Age (years) Mean ± SD	54.26 ±4.35	
Age (n, %) 40-49 50-59 ≥60	 47 224 47	 14.8% 70.4% 14.8%
Residence (n, %) Urban Rural	 172 146	 54.1% 45.9%
Occupation (n, %) Employee Manual worker Housewife	 84 56 178	 26.4% 17.6% 56.0%
Socioeconomic status (n, %) High Middle Low	 5 235 78	 1.6% 73.9% 24.5%
Weight (Kg) Mean ± SD	84.60	±9.17
Height (cm) Mean ± SD	160.19	±2.40
BMI (kg/m^2) Mean ± SD	32.98	±3.68

Table 2: Vulvovaginal symptoms of the study participants (n = 318).								
VVA symptom	Absent No .	(%)	Mild No.	(%)	Moderate No.	(%)	Severe No.	(%)
Vaginal dryness	57	(17.9)	4	(14.5)	126	(39.6)	131	(41.2)
Vaginal itching	87	(27.4)	124	(39.0)	86	(27.0)	21	(6.6)
Vaginal discharge	49	(15.4)	48	(15.1)	216	(67.9)	5	(1.6)
Decreased vaginal lubrication	22	(6.9)	47	(14.8)	30	(9.4)	219	(68.9)
Dyspareunia	42	(13.2)	46	(14.5)	218	(68.6)	12	(3.8)
Irritation in vuvla and vagina	36	(11.3)	217	(68.2)	35	(11.0)	30	(9.4)
Decreased arousal. Orgasm, or sexual desire	8	(2.5)	44	(13.8)	141	(44.3)	125	(39.3)
Dysuria	33	(10.4)	111	(34.9)	165	(51.9)	9	(2.8)
Urinary frequency	11	(3.5)	11	(3.5)	177	(55.7)	119	(37.4)
Urinary urgency	0	0	9	(2.8)	26	(8.2)	283	(89.0)
Post-coital bleeding	312	(98.1)	6	(1.9)	0	0	0	0
Urethral discomfort	156	(49.1)	90	(28.3)	68	(21.4)	4	(1.3)
Hematuria	318	(100)	0	0	0	0	0	0
Recurrent UTI	32	(10.1)	14	(4.4)	267	84.0	5	(1.6)

Table 3: Score of Vulvovaginal symptoms severity domains of the study participants (n = 318).				
Domains	Median	IQR	Maximum	Minimum
Severe Vaginal symptoms	8.75	3.08	14.00	0
Severe Vulvar symptoms	5.02	1.82	9.00	0
severe Urinary symptoms	9.12	2.46	15.00	1

Table 4: Vulvovaginal signs of the study participants (n = 318).				
VVA signs	Yes N %		No N %	
Abnormal discharge	128	(40.3%)	190	(59.7%)
Decreased moisture	301	(94.7%)	17	(5.3%)
Loss of vaginal rugae	58	(18.2%)	260	(81.8%)
Vaginal Pallor	47	(14.8%)	271	(85.2%)
Spasm of elevator muscle on palpation of posterior vagina	67	(21.1%)	251	(78.9%)
Decreased elasticity	70	(22%)	248	(78%)
Fragility/ Fissures/ Petechiae	32	(10.1%)	286	(89.9%)
Loss of hymenal remnants	103	(32.4%)	215	(67.6%)
Labia minora resorption	31	(9.7%)	287	(90.3%)
Introital retraction	43	(13.5%)	275	(86.5%)
Prominence urethral meatus	23	(7.2%)	295	(92.8%)
Urethral prolapse	0	(0%)	318	(100%)

There were statistical insignificant differences between participants with and without severe symptoms as regards age, comorbidities, smoking and pelvic operations as p>0.05. BMI was statistically significantl higher among severity groups (p=0.038) as in table 5.

Table (6) demonstrated the mean scores of the FSFI scale among groups of VVA severity symptoms, which found that participants without severe symptoms had significantly highest arousal score mean±SD (2.63±0.82) and lowest pain score mean±SD (3.95±1.01) than participants with severe symptoms with p value of <0.001 and 0.011, respectively. Among women with severe symptoms, women with severe vaginal symptoms had lowest arousal score mean±SD (2.09±0.48) and lubrication score mean±SD (3.95±1.18) than other groups, while participants with severe urinary symptoms had the highest mean score of pain mean±SD (4.38±1.1) than other groups (p=0.011).

Table 5: Comparison between Female sexual function index scores among participants groups according to VVA severity.						
Domain mean±SD	Total participants (n=318)	Without severe symptoms (n=86)	With severe vaginal symptoms (n=59)	With severe valvular symptoms (n=133)	With severe urinary symptoms (n=220)	P-value
Desire	2.47±0.77	2.59±1.06	2.37±0.61	2.43±0.66	2.43±0.77	0.097
Arousal	2.36±0.64	2.63±0.82	2.09±0.48	2.17±0.49	2.26±0.55	<0.001*
Lubrication	4.04±0.97	3.89±0.99	3.95±1.18	4.05±1.04	4.10±0.99	0.023*
Orgasm	3.68±1.14	3.61±1.18	3.63±1.28	3.53±0.85	3.69±1.15	0.903
Satisfaction	3.58±0.77	3.58±0.81	3.46±0.76	3.37±1.14	3.58±0.78	0.750
Pain	4.26±1.07	3.95±1.01	4.32±1.32	4.26±2.67	4.38±1.1	0.011*
Total score	20.25±5	19.83±5.12	19.83±5.12	20.25±4.58	20.44±4.54	0.276
*ANOVA test used. *Statistically significant as p<0.05.*						

Table 6: Comparison between demographic characteristics among participants groups according to VVA severity.					
Characteristics	Without severe symptoms (n=86)	With severe vaginal symptoms (n=59)	With severe valvular symptoms (n=133)	With severe urinary symptoms (n=220)	P-value
Age (years) mean±SD	54.2±4.9	54.8±4.1	54.3±4.3	54.3±4.2	0.949[1]
Age 40-49 50-59 ≥60	n % 18 (20.9%) 53 (61.6%) 15 (17.4%)	N % 7 (11.9%) 41 (69.5%) 11 (18.6%)	N % 17 (12.8%) 96 (72.2%) 20 (15%)	N % 28 (12.7%) 160 (72.7%) 32 (14.5%)	0.835[2]
BMI (kg/m^2) mean±SD	29±3.1	33.4±3.6	32.8±3.8	32.3±3.9	0.038*[1]
Comorbidities Yes No	N % 16 (18.6%) 70 (81.4%)	N % 15 (25.4%) 44 (74.6%)	N % 34 (25.6%) 99 (74.4%)	N % 49 (22.3%) 171 (77.7%)	0.783[2]
Smoking Yes No	N % 4 (4.7%) 82 (95.3%)	N % 1 (1.7%) 58 (98.3%)	N % 2 (1.5%) 131 (98.5%)	N % 3 (1.4%) 217 (98.6%)	0.508[2]
Pelvic operations Yes No	N % 25 (29.1%) 61 (70.9%)	N % 15 (25.4%) 44 (74.6%)	N % 39 (29.3%) 94 (70.7%)	N % 59 (26.8%) 161 (73.2%)	0.677[2]
ANOVA test used. 2. Qui square test used.					

Discussion

The average age of the participants was 54.26 (±4.35), with most of them (70.4%) being between the ages of 50 and 59. Additionally, most of the participants (54%) resided in metropolitan regions. In the current research, more than half of the women were housewives (56%), and a majority of them had a moderate economic position (73.9%). The average BMI of the women was 32.98, and 81.8% of them were considered obese. Obesity is a complicated condition that involves the accumulation of extra fat, which is then turned into circulating estrogen. In the postmenopausal stage, estradiol levels are frequently less than 30 pg/mL, obesity associated to atherosclerosis which lead to HTN [8].

This was similar to Palacios et al.[9], Nappi et al. [10], and Particco et al. [11] who all reported increased mean BMI among their patients, where the mean BMI of the patients in both studies by Palacios et al. and Nappi et al. was 26.0, while the patients in Particco et al. had a mean BMI of 25.7. This is in line with the results of the Singhania research, which confirmed that the number of menopausal women who are overweight or obese has grown [12,13].

In this research, the majority of individuals (69.2%) reported experiencing severe urine symptoms, 41.8% reported experiencing severe vaginal symptoms, and 18.6% reported experiencing severe vulvar symptoms. The absence of estrogen may be the reason for the high occurrence of urinary symptoms. This is because it

reduces the capacity of the urinary system to regulate urine and increases the likelihood of urinary tract infections.

Our data is distinct from another study that included a total of 2,160 women who were able to be evaluated. In that study, 66.3% of the women had severe vaginal symptoms, 30.5% had severe vulvar symptoms, and 11.2% had severe urine symptoms [14]. The disparity between the two studies may be explained by the difference in sample size between our research and this one. This research looked at the vulvovaginal indicators of the women. We discovered that the most common indication of VVA among the patients was reduced moisture (94.7%), followed by abnormal discharge (40.3%). This was explained by The vaginal epithelium is a stratified squamous epithelium that is moist and dense with rugae till menopause [15].

The vaginal epithelium becomes thinner after menopause as estrogen levels decrease. This is consistent with the findings of Nappi et al. [14], which indicated that the most prevalent symptoms related with VVA in European postmenopausal women were vaginal dryness (70.0%) and dyspareunia (30.0%).

Angelou et al. [16] also found that around 90% of their patients had vaginal dryness, nearly 80% of the women experienced discomfort during intercourse, and 28% of the women experienced urine urgency.

In our current research, we utilized the FSFI to evaluate the sexual function of the participants. We discovered that individuals who had significant vaginal and urinary symptoms had the lowest arousal score (2.09±0.48) and lubrication score (3.95±1.18) and the highest pain score (4.38±1.1) compared to the other groups (p=0.011). This connected to reduce blood flow, nerve stimulation and decrement lipido produced by condition of hypoestroginism.

Particco et al. [11] discovered that the average FSFI score of their patients was 19.8 (±10.8), which is consistent with our findings. The pain and happiness domains were the ones in which their patients received the highest ratings. On the other side, the Desire and arousal domains had the lowest ratings.

Palacio et al. [9], on the other hand, analyzed the major differences between patients who had more than one symptom of VVA and a verified diagnosis of VVA and those who had no confirmed diagnosis. They observed that all domains changed substantially between the two groups. This is a result of the huge sample size that was employed in the Palacio research.

Conclusion

VVA symptoms is prevalent among postmenopausal women especially severe symptoms. Women with high BMI were more affected with severe symptoms than women with lower BMI. The female sexual function is less likely to be affected in the presence of moderate to severe VVA symptoms

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