

Hypertension is related with impaired sexual function in postmenopausal women. Prospective case-control study.



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Hypothesis / aims of study

Women may experience sexual dysfunction at various stages of their adult life, particularly after menopause. Globally, 40% and 85% of reproductive and postmenopausal women have sexual dysfunction. Maintaining a healthy sexual function in women necessitates a harmonious blend of emotional and physical well-being. The intricate interplay between structural and functional changes can pose challenges when diagnosing and treating female sexual dysfunction (FSD). (1) It is widely recognized that FSD has a significant impact on women's quality of life. Thus, it is crucial for healthcare experts to thoroughly examine this situation. Sexual dysfunction is frequently neglected in hypertensive women, despite the fact that 42.1% of them experience it. There is currently limited research that establishes a clear connection between hypertension and FSD. Studies on female sexuality have demonstrated that reduced clitoris blood flow impairs sexual functioning. In this particular study, the researchers have utilized clitoris artery doppler indices and vaginal epithelium cytology to examine the potential connection between female sexual dysfunction (FSD) and hypertension in postmenopausal women.

Study design, materials and methods

The study included consecutive, sexually active postmenopausal women who were referred to outpatient gynecologic clinic for well-woman examination. Exclusion criteria included women with multiple sclerosis, spinal cord damage, active malignancy, and unsigned informed consent. After signing the consent form, individuals underwent:

- Medical history
- Clinical examination: (blood pressure, vital signs, POP-Q, and vaginal - perineal sensitivity).
- Laboratory tests: hormonal profile.
- Ultrasound examination: clitoral atherosclerosis was assessed using ultrasound doppler pulsatility index (PI) and resistance index (RI) of the clitoral artery (A RIC5-9-RS Probe from the Voluson S10 system by GE Healthcare was gently positioned sagittally on the clitoris at a slight angle less than 20°, ensuring minimal pressure on the tissues. Using color flow mapping, the clitoral artery was identified and the Doppler probe was carefully positioned over the vessel to capture at least three consecutive Doppler waveforms). (2)
- Cytologic test of vaginal epithelium for determination of level of vaginal atrophy (vaginal atrophy index)
- Completion of validated questionnaires:
 - FSFI (Female Sexual Function Index), an 19-item questionnaire with values 2-36 (normal score>26.55). (3)
 - SQOL-F (Sexual Quality of Life-Female), an 18-item questionnaire with values 18-108. (3)
 - BDI (Beck's Depression Inventory),
 - BAI (BECK Anxiety Inventory).

A sample of 86 menopausal women (43 normotensive and 43 hypertensive) was calculated as necessary to identify a difference of 3.0 units in the FSFI score with an error 0.05 and 80% power.

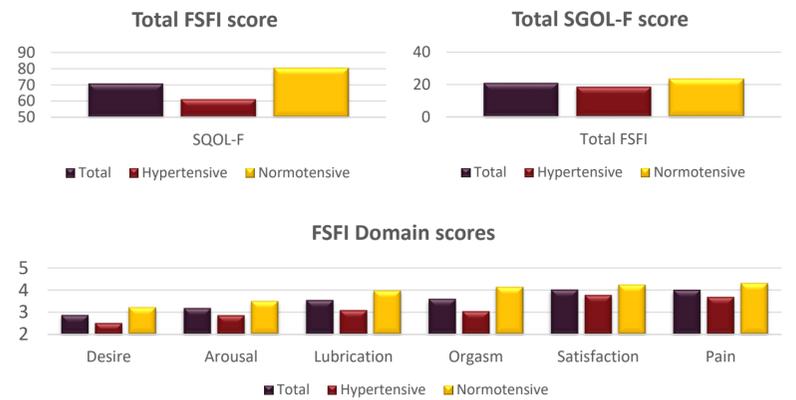
Table 1

Hyper vs Normotensive and sexual function results				
Demographics	Total	Hypertensive	Normotensive	p
Total Number of patients, N	91	45	46	-
Mean age, years	62.60±5.70	63.27±5.24	62.20±6.08	0.370
Mean BMI, kg/m ²	29.52±4.16	29.46±4.52	29.59±3.83	0.883
Years in menopause	12.65±6.34	13.56±6.05	11.76±6.57	0.178
Parity, N	2.22±0.77	2.24±0.68	2.20±0.86	0.764
BDI	9.41±8.93	9.78±9.56	9.04±8.36	0.698
BAI	8.40±9.68	8.76±11.23	8.04±7.98	0.729
Sexual function	Total	Hypertensive	Normotensive	p
Total	21.00±7.16	18.58±5.83	23.39±7.55	0.001†
Desire	2.87±1.25	2.51±1.09	3.22±1.30	0.006†
Arousal	3.18±1.42	2.86±1.19	3.50±1.55	0.028†
Lubrication	3.54±1.33	3.09±1.21	3.97±1.31	0.001†
Orgasm	3.60±1.59	3.04±1.42	4.14±1.57	0.001†
Satisfaction	4.01±1.33	3.77±1.05	4.24±1.54	0.089
Pain	4.00±1.35	3.68±1.29	4.31±1.35	0.024†
SQOL-F	70.82±26.68	61.07±23.41	80.37±26.45	0.001†
Clitoris artery atherosclerosis	Total	Hypertensive	Normotensive	p
PI	2.91±0.94	3.20±0.77	2.63±1.01	0.003†
RI	1.02±0.31	1.05±0.29	1.00±0.33	0.530
Vaginal atrophy level	Total	Hypertensive	Normotensive	p
Low	23/91 (25.3%)	5/45 (11.1%)	19/46 (41.3%)	<0.001†
Moderate	38/91 (41.8%)	19/45 (42.2%)	19/46 (41.3%)	
High	30/91 (33.0%)	21/45 (46.7%)	8/46 (17.4%)	

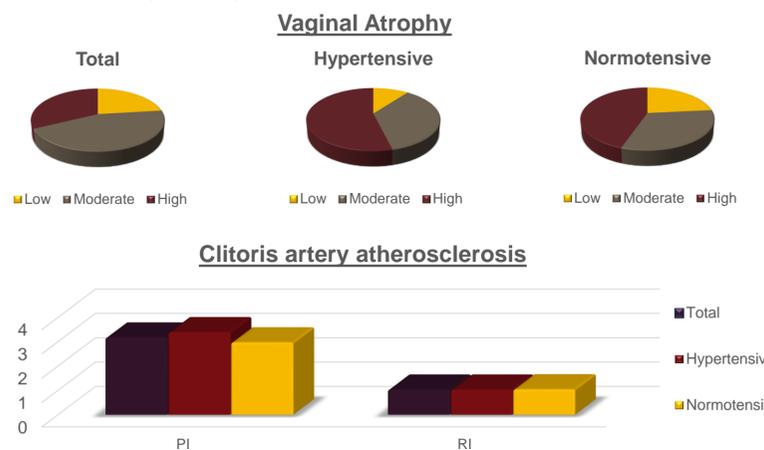
†: statistically significant
BMI: Body Mass Index, FSFI: Female Sexual Function Index, SQOL-F: Sexual Quality of Life-Female, BDI: Beck's Depression Inventory, BAI: BECK Anxiety Inventory, PI: Pulsatility index, RI: Resistive index

Results and interpretation

From January of 2021 to March of 2024, a total of 91 Caucasian women (45 hypertensive subjects and 46 normotensive controls) were eligible for and included in the study. The participants had a mean age of 62.60±5.70 and had been in menopause for an average of 12.65±6.34 years; their BMI was 29.52±4.16; their mean arterial pressure (MAP) was 99.35±13.13; and their total FSFI score was 20.2±6.6. No significant difference was found in mean age, BMI, parity, or years in menopause between normotensive and hypertensive patients. Hypertensive and normotensive women's hormonal tests showed no pathological findings. In addition, hypertensive women had higher statistically significant MAP (105.76±13.42 vs 93,08±9.36), had more commonly diabetes mellitus, and dyslipidemia as compared to normotensive participants. Regarding FSD, hypertensive individuals had statistically significant worsen sexual life than normotensive (mean FSFI score 18.58±5.83 vs 23.39±7.55 p<0.05, mean SQOL-F score 61.07±23.41 vs 80.37±26.45 p<0.05). Hypertensive women had more impaired clitoris artery blood flow and in average increased vaginal atrophy compared to normotensive (p<0.001).



More specific, high level of vaginal atrophy was identified in approximately 46.7% and 17.4% of hypertensive and normotensive participant, respectively. Moreover, hypertensive subgroup measured with higher clitoral artery PI (3.20±0.77 vs 2.63±1.01, p<0.05), suggesting higher level of clitoris artery atherosclerosis. (Table 1)



In analyzing women without dyslipidemia and diabetes, we observe that normotensive women consistently demonstrate statistically significant better sexual function, lowered atherosclerosis of the clitoral artery, and a lower incidence of vaginal atrophy compared to hypertensive women. (Table 2)

Table 2

Hyper vs Normotensive without diabetes and dyslipidemia and sexual function results			
Demographics	Hypertensive	Normotensive	p
Total Number of patients, N	23	34	-
Mean age, years	62.3±4.99	61.2±6.23	0.430
Mean BMI, kg/m ²	28.42±3.73	29.22±3.79	0.442
Years in menopause	12.70±6.53	10.44±5.83	0.189
Parity, N	2.26±0.75	2.06±0.81	0.341
BDI	10.09±11.18	8.65±8.46	0.603
BAI	9.04±14.41	8.15±8.40	0.790
Sexual function	Hypertensive	Normotensive	p
FSFI	19.49±4.39	24.25±7.89	0.005†
SQOL-F	62.30±21.61	82.41±26.39	0.003†
Clitoris artery atherosclerosis	Hypertensive	Normotensive	p
PI	3.39±0.76	2.63±1.07	0.003†
RI	0.99±0.19	1.03±0.35	0.530
Vaginal atrophy level	Hypertensive	Normotensive	p
Low	4/23 (17.4%)	15/34 (44.1%)	<0.001†
Moderate	9/23 (39.1%)	12/34 (35.3%)	
High	10/23 (43.5%)	7/34 (20.6%)	

†: statistically significant

Interpretation of results

Female sexual dysfunction still remains an under-investigated field, specifically in menopausal women. There are several factors that contribute to the lack of comprehensive research, such as emotional, gynecological, psychological disorders, and the natural aging process. The management of all these factors can often be difficult in the research setting. Our study aimed to emphasize the connection between hypertension and sexual dysfunction, and our null hypothesis was that women with hypertension should have decreased FSFI scores, a finding that could be further related with decreased arterial flows in the pelvic floor. The reduction of the blood flow can lead in the development of fibrosis in the smooth muscle and subsequent atrophy of certain areas, such as the clitoris and vaginal wall. Apparently, the reduced flows in these organs, if the results of this study are further confirmed, could be a therapeutic target for appropriate medication.

Moreover, this study indicates that hypertensive women are prone to impaired sexual function according to FSFI scores.

Conclusions

Ultimately, this study indicates that postmenopausal women with high blood pressure may experience a greater occurrence of Female Sexual Dysfunction (FSD), which is linked to the deterioration of vaginal health and the development of clitoral artery atherosclerosis. This could be a completely new factor that contributes to the increased prevalence of female sexual dysfunction in postmenopausal women with hypertension. Further investigation is necessary to validate this connection.

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