Experimed 2023; 13(1): 59-63

ORIGINAL ARTICLE

DOI: 10.26650/experimed.1255831

Impact of Anogenital Distance Parameters on Female Sexual Dysfunction

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Cite this article as: Ergul A, Yuksel Ozgor B. Impact of anogenital distance parameters on female sexual dysfunction. Experimed 2023; 13(1): 59-63.

ABSTRACT

Objective: The aim of this study was to investigate the relation between anogenital distance (AGD) and female sexual dysfunction.

Materials and Methods: The present study was done prospectively between January 2021 - July 2022. All patients filled out the Female Sexual Function Index (FSFI) score and the Sexual Quality of Life-Female score (SQOL-F). Also, AGD was measured in all patients. Patients were classified into two groups according to FSFI (FSFI <27 and FSFI ≥27) and into three groups according to SQOL-F (SQOL-F 18-51, SQOL-F 52-84, SQOL-F >84). Groups were compared according to age, body mass index (BMI), parity status, anogenital anoclitoral distance (AGD_{AC}), anus to fourchette distance (AGD_{AF}), and genital hiatus (GH). Also, correlation analysis was performed between sexual function scores and AGD.

Results: Totally, 280 patients were enrolled into the study and 89 (31.8%) patients had sexual dysfunction according to FSFI. AGD_{AC} (74.7 mm vs 64.6 mm, p= 0.001) and GH length (27.8 mm vs 22.0 mm, p= 0.001) were significantly longer in patients with sexual dysfunction. In addition, GH and AGD_{AC} were significantly shorter in patients with the highest SQOL-F. Correlation analysis showed no significant correlation between AGD_{AF} and sexual function (p= 0.671 for FSFI and p=0.294 for SQOL-F). However, longer AGD_{AC} was significantly and negatively correlated with healthy sexual status (r= - 0.546, p= 0.001 for FSFI and r= - 0.604, p= 0.001 for SQOL-F). In addition, longer GH distance was significantly associated with female sexual dysfunction (p= 0.001 for FSFI and p= 0.001 for SQOL-F).

Conclusion: The present study demonstrated that almost one third of women had sexual dysfunction. Also, the present study found that longer AGD_{AC} and GH were significantly associated with female sexual dysfunction and female sexual dissatisfaction according to FSFI and SQOL-F for the first time.

Keywords: Anogenital distance, genital hiatus, female sexual dysfunction, FSFI, SQOL-F

INTRODUCTION

Female sexual dysfunction is accepted as a clinically significant inconvenience in sexual relations which is associated with personal distress. It is well known that an unsatisfactory sex life may result in depression, loss of self-confidence, and deterioration of the relationship with a partner (1,2). For many years, discussing predictive factors and solutions for female sexual dysfunction has been considered taboo, and female sexual dysfunction has been overlooked. However, studies conducted towards the end of the 20th century showed that almost 2 out of every 5 women suffer from sexual dysfunction (3). Predictive factors for female sexual dysfunction are one of the hottest topics in gynecology, and previous reports investigated many factors that may play a role in female sexual dysfunction, including menopausal status, surgical history, and anatomical factors (4).

Anogenital distance (AGD) is an anatomical landmark which describes the distance between the anus and external genitalia. AGD has been the subject of many studies, and the effect of AGD on prostate cancer, polycystic ovary, endometriosis, incontinence, and

Corresponding Author: Aslıhan Ergul **E-mail:** aslihanergul.md@gmail.com
Submitted: 24.02.2023 **Revision Requested:** 06.03.2023 **Last Revision Received:** 06.03.2023 **Accepted:** 16.03.2023 **Published Online:** 13.04.2023

premature ejaculation has been investigated (5). Toprak et al. analyzed AGD in patients with premature ejaculation, and AGD was found to be significantly longer in patients who suffered from premature ejaculation (6). Also, Sánchez-Ferrer and colleagues stated that increased genital hiatus (GH) length and anogenital anoclitoral distance (AGD_{AC}) played a role in pelvic prolapse in females (7). In addition, some authors have concluded that stress urinary incontinence is significantly more common in women with longer AGD_{AC} and shorter anus to fourchette distance (AGD_{AF}) (8).

While previous studies investigated the impact of AGD on some female diseases, no study has analyzed the correlation between AGD and female sexual function. The aim of the present study was to investigate the relation between AGD and female sexual dysfunction.

MATERIALS AND METHODS

The present study was done prospectively between January 2021 – July 2022, and 280 woman who were admitted as gynecology outpatients were evaluated for inclusion in the study. All participants signed informed consent. Ethics committee approval was obtained from the Istanbul Haseki Training and Research Hospital ethics committee (2020-124). The medical history of patients was recorded, and a physical examination was performed for all participants. All patients completed the Sexual Quality of Life-Female score (SQOL-F) and the Female Sexual Function Index (FSFI) score under the supervision of a physician. Also, AGD was measured in all patients. Patients were classified into two groups according to FSFI (FSFI <27 and FSFI ≥27) and into three groups according to SQOL-F (SQOL-F 18-51, SQOL-F 52-84, SQOL-F >84). Patients who were not able to fill out the FSFI or SQOL-F, patients with severe psychiatric disease, patients with endocrine disorders, pregnant patients, patients in the postpartum period, patients in menopause, and patients abstaining from sexual intercourse were excluded from the study. Other exclusion criteria were being <18 years old, history of perineal surgery, and infectious conditions in the anogenital area.

Patients' demographic information were noted. The AGD was measured by digital caliper (Supplier: VWR® International, LLC, West Chester, PA, USA) in the lithotomy position. Length from the upper edge of the anus to the clitoris was defined as AGD_{AC}. Linear measurement between the upper edge of the anus and fourchette was AGD_{AF}. GH length was measured between the center of the urethral meatus and perineum nucleus. To prevent incorrect or erroneous measurements, two physicians measured each parameter mentioned above.

FSFI and SQOL-F score

The FSFI is a survey, containing 19 questions, used for evaluation of female sexual function. The questionnaire gives information about arousal, desire, orgasm, pain, lubrication, and satisfaction, and the FSFI scored from 2 to 36 for each patient. An FSFI score <26 is related to female sexual dysfunction (9). The SQOL-F is a self-reported questionnaire containing 18 items. Each question is scored from 1 to 6 or 0 to 5 and the total SQOL-F score ranges from 18 to 108 (worst to best) (10).

To understand the impact of AGD on sexual function, patients were categorized into two groups according to FSFI (FSFI <27 and FSFI ≥27) and into three groups according to SQOL-F (SQOL-F 18-51, SQOL-F 52-84, SQOL-F >84). Groups were compared according to age, body mass index (BMI), parity status, AGD_{AC}, AGD_{AF}, and GH. Also, correlation analysis was performed between sexual function scores and AGD.

Statistical Analysis

The Statistical Package for the Social Sciences version 25 (SPSS IBM Corp., Armonk, NY, USA) program was used. The independent Student's t test was performed to analyze normally distributed parameters, and the Mann-Whitney U test was used to evaluate non-normally distributed data. The one-way ANOVA test and the Kruskal Wallis test were used for continuous parameters. The relationships between AGD, FSFI, scores and SQOL-F scores were evaluated with bivariate correlation analysis. Categorical variables were analyzed using the $\chi 2$ test. A p value of less than 0.05 was defined as statistically significant.

RESULTS

In total, 280 patients were enrolled into the study. The mean age and mean BMI of participants were 31.5 years and 27.0 kg/m^2, respectively. A total of 17.5% (49 women) were nulliparous. The mean AGD_{AF}, AGD_{AC}, and GH distances were 24.5 mm, 67.8 mm, and 23.8 mm, respectively. Also, mean FSFI and mean SQOL-F were 29.3 and 65.5 for all patients (Table 1).

Table 1. Characteristics of patients.

	n=280
Age (years)*	31.5±7.4
BMI (kg/m^2)*	27.0±4.8
Parity n; (%)	
Nulliparous	49 (17.5%)
Parity ≥1	231 (82.5%)
AGD from the anus to the fourchette (mm)*	24.5±6.1
AGD from the anus to the clitoris (mm)*	67.8±9.9
GH (mm)*	23.8±5.7
FSFI score*	29.3±5.4
SQOL-F score*	65.5±23.4

*Mean ± standard deviation; AGD: Anogenital distance; GH: Genital hiatus; FSFI: Female sexual function index; SQOL-F: Sexual Quality of Life-Female score.

Table 2. Demographic data and AGD according to FSFI score.

	FSFI score <27 (n:89)	FSFI score ≥27 (n:191)	p value
Age (years)*	32.3±6.6	31.1±7.7	0.649
BMI (kg/m^2)*	26.8±4.9	27.1±4.7	0.327
Parity n; (%)			
Nulliparous	19 (21.3%)	30 (15.7%)	0.637
Parity ≥1	70 (78.7%)	161 (84.3%)	
AGD_{AF} (mm)*	24.9±5.4	24.3±6.4	0.388
AGD_{AC} (mm)*	74.7±8.2	64.6±9.0	***0.001***
GH (mm)*	27.8±6.7	22.0±4.2	***0.001***

*Mean ± standard deviation; AGD_{AC}: Anogenital distance from the anus to the clitoris, AGD_{AF}: Anogenital distance from the anus to the fourchette, BMI: Body mass index, GH: Genital hiatus, FSFI: Female Sexual Function Index.

Eighty-nine (31.8%) patients had sexual dysfunction according to FSFI. Comparison of the groups according to FSFI revealed that age, BMI, parity status, and AGD_{AF} were comparable (p= 0.649, p= 0.327, p= 0.637, and p= 0.388). However, AGD_{AC} (74.7 mm vs 64.6 mm) and GH length (27.8 mm vs 22.0 mm) were significantly longer in patients with sexual dysfunction (p= 0.001 and p= 0.001) (Table 2). In addition, 77 women had SQOL-F between 18-51, 120 women had SQOL-F between 52-84, and 83 women had SQOL-F >84, respectively. Age, BMI, parity status, and AGD_{AF} were similar between groups according to SQOL-F. AGD_{AC} and GH were significantly shorter in patients with the highest SQOL-F (Table 3).

Correlation analysis found no significant outcome between AGD_{AF} and sexual function scores (p= 0:671 for FSFI and p= 0.294 for SQOL-F). Longer AGD_{AC} was significantly negatively correlated with healthy sexual status (p= 0.001 for FSFI and p= 0.001 for SQOL-F). Longer GH distance was significantly associated with female sexual dysfunction (p= 0.001 for FSFI and p= 0.001 for SQOL-F). Correlation analysis for AGD and sexual function scores are summarized in Table 4.

DISCUSSION

Female sexual dysfunction is an overlooked disorder. Many women accept this situation as normal and hesitate to consult a doctor. Additionally, some societies opinion female sexual dysfunction as something to be ashamed of (11). However, a healthy sexual life is essential for a normal life and good partner relationships. We believe that clarifying predictive factors that may be associated with female sexual dysfunction is crucial. Thus, this study was conducted to investigate the correlation between AGD and sexual health for women. Almost one third of women women suffered from sexual dysfunction, and longer AGD_{AC} and GH were associated with female sexual dysfunction and female sexual dissatisfaction.

The AGD_{AC} area includes nerve-rich genitalia clitoris, labia minor, and labia majora. Sertkaya et al. investigated the

Table 3. Demographic data and AGD according to SQOL-F score.

	SQOL-F Score 18-51 (n:77)	**SQOL-F Score 52-84 (n:120)**	**SQOL-F Score >84 (n:83)**	**p value**
Age (years)*	31.3±6.7	30.8±7.4	32.6±7.8	0.281
BMI (kg/m^2)*	26.8±4.8	26.7±4.2	27.6±5.5	0.176
Parity n;(%)				
Nulliparous	16 (20.8)	19 (15.8)	14 (16.9)	
Parity ≥1	61 (79.2)	101 (84.2)	69 (83.1)	0.647
AGD_{AF} (mm)*	24.0±5.3	24.7±6.9	24.6±5.5	0.750
AGD_{AC} (mm)*	77.4±6.2	66.0±9.9	61.5±5.1	***0.001*** **
GH (mm)*	29.5±5.7	22.7±3.7	20.2±4.0	***0.001*** **

*Mean ± standard deviation; AGD_{AC}: Anogenital distance from the anus to the clitoris, AGD_{AF}: Anogenital distance from the anus to the fourchette, BMI: Body mass index, GH: Genital hiatus, SQOL-F: Sexual Quality of Life-Female. **Significant difference according to ANOVA test.

Table 4. Correlation analysis between AGD and sexual function scores.

	FSFI score	SQOL-F Score
AGD_{AF} (mm)		
r	0.025	0.063
p value	0.671	0.294
AGD_{AC} (mm)		
r	-0.546	-0.604
p value	***0.001***	***0.001***
GH (mm)		
r	-0.504	-0.603
p value	***0.001***	***0.001***

AGD_{AC}: Anogenital distance from the anus to the clitoris, AGD_{AF}: Anogenital distance from the anus to the fourchette, GH: Genital hiatus, FSFI: Female Sexual Function Index, SQOL-F: Sexual Quality of Life-Female. (r= 0-0.3 (weak correlation), r= 0.3-0.7 (medium correlation), r= 0.7-1 (strong correlation))

impact of anus-scrotum distance and anus distance on premature ejaculation, and the author found that distances were significantly lower in patients with premature ejaculation (12). In another study, Domenici and colleagues evaluated correlations between AGD and female sexual health and found shorter AGD was related with vulvovaginal atrophy and sexual function impairment. However, Domenici et al. only investigated women in the post-menopausal period (13). In contrast, we found that women with shorter AGD_{AC} had significantly better sexual function. In contrast to Domenici's study, only pre-menopausal women were included in our study. Also, we believe that longer AGD_{AC} may be the result of pelvic trauma, such as vaginal birth, which may be associated with perineal nerve damage and lack of estrogen support. The effect of birth number and hormonal status may be subjects for further investigations. No significant correlation was found between AGD_{AF} and female sexual health.

Previous studies intensively studied the effect of GH on pelvic organ prolapse and incontinence, but not on female sexual function (7, 8). The GH distance is known to directly affect vaginal introitus length and pelvic relaxation may occur due to various factors including aging, vaginal births, obesity, and pelvic surgeries. Many studies reported that many women requested genital aesthetic surgeries due to enlarged vaginal introitus and increased vaginal laxity. Abedi and colleagues compared patients before and after vaginal tightening surgery using FSFI, and the FSFI score of participants increased from 24.19 to 26.92 after vaginal tightening surgery (14). Similarly, Millheiser et al. stated that vaginal tightening with radiofrequency treatment significantly increased female sexual function according to FSFI (15). In the present study, we found that increases in GH were associated with female sexual dysfunction and female sexual dissatisfaction. Due to this outcome, we suggest that female patients with long GH distance should be evaluated for sexual function.

This study has some limitations. This study was done as survey study, and participant answers may have been affected by their current psychological state or the environment. To prevent this situation, all patients answered questions in a silent room without time constraints. Secondly, perineal anatomic features could be affected by race and age; however, we did not focus on these factors, which may be subjects for further studies. Additionally, we could not evaluate duration of sexual dysfunction and AGD at the beginning of sexual dysfunction.

The present study found that almost one third of women had sexual dysfunction. Also, the present study found that longer AGD_{AC} and GH were significantly associated with female sexual dysfunction and female sexual dissatisfaction according to FSFI and SQOL-F for the first time. To better understand the effect of AGD on female sexual health, the present study outcome should be confirmed by further prospective studies with high patient volume. The results of the AGD measurement may be used in the future for the treatment of female sexual function.

Ethics Committee Approval: Ethics committee approval was obtained from the Istanbul Haseki Training and Research Hospital ethics committee (2020-124). All participants signed informed consent.

Author Contributions: Conception/Design of Study- A.G.; Data Analysis- A.G.; Interpretation and Drafting Manuscript- B.H.O.; Critical Revision of Manuscript- A.G.; Final Approval – A.G., B.H.O.

Conflicts of Interest: The authors declare no conflict of interest.

Financial Disclosure: The authors declare that this study has received no financial support.

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