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## CLINICAL ARTICLE

## Lower urinary tract symptoms following female genital mutilation

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## ABSTRACT

**Objective:** To estimate the prevalence of lower urinary tract symptoms (LUTS) following female genital mutilation (FGM). **Methods:** A hospital-based, cross-sectional study was conducted from January 1, 2009, through January 1, 2012, at the urogynecology clinic of Sohag University Hospital. The participants were 251 women who had undergone different forms of FGM. **Results:** A total of 251 women agreed to participate. All had the clitoris amputated, 7.1% had some form of mutilation to the labia majora, 33.8% had adhesions of the labia minora, 19.2% had clitoral retention cysts, and 38.8% reported at least 1 LUTS. Nocturia (38.6%) was the most prevalent LUTS, intermittency (23.5%) was the most prevalent voiding LUTS, and incomplete voiding (22.7%) was the most common post-micturition LUTS. All 3 types of LUTS were reported by 11.6% of the women. Those with Type II and Type III FGM had a significantly higher risk of having all 3 LUTS than those with Type I. **Conclusion:** Women with FGM are significantly more likely to have LUTS than women without FGM, and LUTS seem to be more burdensome in those with more extensive FGM.

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## 1. Introduction

Female genital mutilation (FGM) is usually carried out in girls between the ages of 5 and 10 years and causes serious health problems. The procedure is widely practiced in many countries, and it was estimated in 1997 that more than 130 million women had undergone some form of FGM, and that more than 3 million girls were at risk of undergoing FGM each year [1]. The practice of FGM is highly prevalent in Egypt, particularly in its upper part, and it was reported that about 89% of Upper Egyptian women underwent FGM [2].

The World Health Organization classified FGM into 4 types, which it described as follows: Type I, partial or total removal of the clitoris and/or the prepuce (clitoridectomy); Type II, partial or total removal of the clitoris and the labia minora, with or without excision of the labia majora (excision); Type III, narrowing of the vaginal orifice with creation of a covering seal by cutting and appositioning the labia minora and/or the labia majora, with or without excision of the clitoris (infibulation); and Type IV, all other harmful procedures to the external female genitalia for nonmedical purposes, for example: pricking, piercing, incising, scraping and cauterization. [3].

Although the health consequences of FGM, both physical and psychological, have been extensively studied, the urinary complications of the procedure have not been sufficiently addressed in the literature [4,5]. Trauma to the urethra and urinary retention are the most

commonly reported urinary complications in the short term [6–8]. Long-term urinary complications occur mainly in complicated cases of FGM. These are associated with damage to the urethral meatus, such as scarring and obstruction, and can lead to chronic incontinence or voiding problems [9]. When the complications caused by the infibulation scar are severe—and voiding problems are frequent complications—defibulation can be performed [10]. "Lower urinary tract symptoms" (LUTS) refers to urine storage and voiding as well as post-micturition symptoms. Although the phrase was introduced in 1994, no studies seem to have tackled the issue of LUTS in women with FGM. The present study was conducted to assess the effect of FGM on the prevalence of LUTS.

## 2. Materials and methods

The present cross-sectional study was conducted from January 1, 2009, to January 1, 2012, at the Urogynecology Clinic of Sohag University Hospital, Sohag, Egypt. Two groups were enrolled, a study group (n = 251) that included all women with FGM who presented to the study clinic for any cause, and a control group (n = 181) that included all women without FGM who presented to the same clinic during the same period. The institutional ethics committee provided approval and written consent was obtained from all participants. The exclusion criteria were a urinary tract infection detected clinically or by urine analysis; a renal or ureteric condition as diagnosed by radiographs or ultrasound; cervicitis and/or vaginitis; pre-existing diabetes mellitus; previous vaginal and/or urethral surgery; and refusal to participate in the study.

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The International Prostate Symptom Score questionnaire was used to inquire about the presence of LUTS, categorized as storage symptoms (i.e. frequency, nocturia, urgency, urgency urinary incontinence (UUI), stress urinary incontinence (SUI), mixed urinary incontinence (MUI), and other (UI); voiding symptoms (i.e. intermittency, slow stream, straining, and terminal dribble); and post-micturition symptoms (i.e. sense of incomplete emptying and post-micturition dribble) [11].

Frequency, nocturia, urgency, UUI, SUI, MUI, intermittency, slow stream, straining, terminal dribble, post-micturition dribble, and incomplete emptying were defined according to 2002 International Continence Society definitions. To keep the data consistent, the simple questionnaire proposed by Irwing et al. [12] was used (Box 1). It was translated into Arabic and printed on special hospital cards, so that each participant had her answers recorded on her individual card. An examination of the vulva was carried out for each participant to record the type of FGM she underwent as defined by the World Health Organization classification.

Statistical analysis was performed using SPSS version 15.0 (IBM, Armonk, NY, USA). To assess the significance of the differences between the 2 groups, the *t* test for independent samples was used for continuous variables and the  $\chi^2$  test or the Fisher exact test was used for categorical variables.  $P < 0.05$  was considered significant. The odds ratio for each storage, voiding, and post-micturition symptom was calculated using linear regression analysis, and the corresponding odds ratios in each group were compared.

### 3. Results

The study group consisted of 251 women with varying types of FGM and the control group of 183 women with no FGM. In the study group, 100% of the women had undergone amputation of the clitoris,

#### Box 1

Questionnaire used for diagnosis of lower urinary tract symptoms.

##### Frequency

Do you feel that you urinate too often during the day?

##### Nocturia

In the last few weeks, how many times did you get up to urinate from the time you went to bed at night until you got up in the morning?

##### Urgency

Do you experience any sudden desire to urinate that is difficult to put off?

##### Urinary incontinence (UI)

How often do you experience involuntary urinary leakage?

##### Urgency urinary incontinence (UUI)

Do you pass urine associated with a sudden, compelling desire to urinate?

##### Stress urinary incontinence (SUI)

Do you leak urine in association with sneezing, coughing, or doing physical activities such as exercising or lifting a heavy object?

##### Straining over the past month

How often have you had to push or strain to begin urination?

##### Terminal dribble

Do you experience prolonged trickle or dribble at the end of your micturition?

##### Incomplete emptying over the past month

How often have you had a feeling of not emptying your bladder completely after you finish micturition?

##### Post-micturition dribble

Do you have urine leakage immediately after you finish urinating and move away from the toilet?

33.8% had their labia minora fused, 7.1% had adhesions of the labia majora, and 19.1% had clitoral retention cysts (data not shown).

The prevalence of storage symptoms (urgency, frequency, and nocturia) was significantly higher in the study group. The most common type of incontinence was MUI (19.1%), followed by UUI (11.5%), and SUI (10.7%). Intermittency was the most common voiding symptom (23.7%), followed by terminal dribbling (19.1%), straining (13.9%), and slow stream (12.3%). Overall, the post-micturition symptoms were reported less often than storage and voiding symptoms, with incomplete emptying at 22.7% and post-micturition dribbling at 19.5%. All symptoms of LUTS were significantly more frequent in the study than in the control group (Table 1).

In the study group, 16.3% of the patients reported having the 3 types of LUTS (storage, voiding, and post-voiding problems). Assessing the prevalence of LUTS according to type of FGM revealed that women with Type II and Type III FGM were at significantly higher risk of having LUTS than those with Type I (Table 2).

### 4. Discussion

Although the physical, psychological, and reproductive implications of FGM are extensively addressed in the literature, the implications for the urinary tract, particularly regarding LUTS, have scarcely been addressed. The present study reports a high prevalence of LUTS among women who underwent FGM. Different variations in the fusion of the labia minora were found in 33.8% of the study patients, and 7.1% had adhesion of the labia majora. These findings are in agreement with those of other studies [13].

In the present study, nocturia was the most common storage symptom whereas MUI was the most common voiding disorder. Post-micturition symptoms were reported less often than storage and voiding symptoms, as 22.7% of the study patients had incomplete voiding and 19.5% had post-micturition dribbling. These findings are inconsistent with those of Irwin et al. [12], who conducted a large study in 5 Western countries (Sweden, the United Kingdom, Germany, Italy, and Canada). They concluded that the prevalence of LUTS may be country specific. This conclusion may explain the contradictory findings between the 2 studies, but no data about the prevalence of LUTS in Egypt are available. Another plausible explanation for the inconsistency between the 2 studies could be attributed to the difference in the participants' mean age.

Table 1

Prevalence of different types of LUTS in the 2 groups.<sup>a</sup>

Symptom	Patients with LUTS (n = 251)	Controls (n = 183)	Odds ratio (95% CI)	P value
<b>Storage</b>				
Urgency	81 (32.27)	27 (14.75)	2.75 (1.66–4.66)	<0.001
Frequency	92 (36.65)	49 (26.77)	1.58 (1.02–2.45)	0.03
Nocturia	97 (38.65)	31 (16.94)	3.09 (1.91–5.08)	<0.001
UUI	29 (11.55)	14 (7.65)	1.58 (0.77–3.33)	0.18
MUI	48 (19.12)	8 (4.37)	5.17 (2.34–12.97)	<0.001
SUI	27 (10.76)	12 (6.56)	1.72 (0.81–3.83)	0.13
<b>Voiding</b>				
Slow stream	31 (12.35)	10 (5.46)	2.44 (1.12–5.72)	0.02
Intermittency	59 (23.50)	28 (15.30)	1.70 (1.01–2.91)	0.04
Straining	35 (13.94)	8 (4.37)	3.54 (1.56–9.05)	0.001
Terminal dribbling	48 (19.12)	15 (8.19)	2.65 (1.39–5.27)	0.001
<b>Post-micturition</b>				
Incomplete emptying	57 (22.71)	18 (9.84)	2.69 (1.49–5.05)	0.001
Dribbling	49 (19.52)	14 (7.65)	2.93 (1.52–5.94)	0.001
All 3 LUTS	41 (16.33)	9 (4.92)	3.77 (1.74–9.06)	0.001

Abbreviations: LUTS, lower urinary tract symptom; MUI, mixed urinary incontinence; SUI, stress urinary incontinence; UUI, urgent urinary incontinence.

<sup>a</sup> Values are given as number (percentage) unless otherwise indicated.

**Table 2**

Relation of LUTS to the different types of FGM.

Symptom	Controls (n = 183)	Type I (n = 148)			Type II (n = 85)			Type III (n = 18)		
	No. (%)	No. (%)	Odds ratio (95% CI)	P value	No (%)	Odds ratio (95% CI)	P value	No. (%)	Odds ratio (95% CI)	P value
<b>Storage</b>										
Urgency	27 (14.75)	30 (20.27)	1.47 (0.79–2.72)	0.19	35 (41.17)	4.04 (2.13–7.66)	<0.001	16 (88.89)	46.22 (9.72–424.16)	<0.001
Frequency	49 (26.77)	21 (14.19)	0.45 (0.24–0.82)	0.005	55 (64.71)	5.01 (2.79–9.06)	<0.001	16 (88.89)	21.88 (4.79–199.71)	<0.0001
Nocturia	31 (16.94)	24 (16.22)	0.95 (0.50–1.77)	0.86	56 (65.88)	9.47 (5.03–17.88)	<0.001	15 (83.33)	24.52 (6.26–136.71)	<0.001
UUI	14 (7.65)	9 (6.08)	0.78 (0.29–2.00)	0.57	12 (14.12)	1.98 (0.79–4.86)	0.10	8 (44.44)	9.96 (2.78–31.91)	<0.001
MUI	8 (4.37)	15 (10.14)	2.47 (1.03–5.85)	0.04	25 (29.41)	9.11 (3.70–24.44)	<0.001	8 (44.44)	17.50 (4.55–65.23)	<0.001
SUI	12 (6.56)	9 (6.08)	0.92 (0.33–2.47)	0.85	15 (17.65)	3.05 (1.26–7.51)	0.005	9 (50.00)	14.25 (4.07–48.42)	<0.001
<b>Voiding</b>										
Slow stream	10 (5.46)	9 (6.08)	1.12 (0.40–3.16)	0.81	15 (17.65)	3.71 (1.46–9.65)	0.001	9 (50.00)	17.30 (4.79–60.93)	<0.001
Intermittency	28 (15.30)	16 (10.81)	0.67 (0.32–1.35)	0.23	32 (37.65)	3.34 (1.76–6.33)	<0.001	11 (61.11)	8.69 (2.76–28.46)	<0.001
Straining	8 (4.37)	7 (4.73)	1.09 (0.32–3.52)	0.87	18 (21.18)	5.88 (2.29–16.28)	<0.001	10 (55.56)	27.34 (7.25–102.83)	<0.001
Terminal dribbling	15 (8.19)	10 (6.76)	0.81 (0.32–2.00)	0.62	26 (30.59)	4.94 (2.32–10.69)	<0.001	12 (66.67)	22.40 (6.48–81.39)	<0.001
<b>Post-micturition</b>										
Incomplete emptying	18 (9.84)	18 (12.16)	1.27 (0.60–2.69)	0.50	30 (35.29)	5.00 (2.46–10.25)	<0.001	9 (50.00)	9.16 (2.78–29.45)	<0.001
Dribbling	14 (7.65)	9 (6.08)	0.78 (0.29–2.00)	0.58	29 (34.11)	6.25 (2.93–13.66)	<0.001	11 (61.11)	18.96 (5.55–65.88)	<0.001

Abbreviations: FGM, female genital mutilation; MUI, mixed urinary incontinence; SUI, stress urinary incontinence; UUI, urgency urinary incontinence.

When LUTS was stratified according to type of FGM in the present study, it was found that there were no significant differences between patients with Type I FGM and the control group. However, the prevalence of all variants of LUTS was significantly higher in those with Type II and Type III FGM. This association could be attributed to a slight trauma to the urethra at the time of FGM, which led to urethral stricture and/or recurrent urethritis, causing slow urine flow and painful micturition. Moreover, during the process of healing in women with Type III FGM, a flap of skin may form over the urethral meatus, which may become an additional obstacle to the flow of urine [14]. Despite these findings and explanations, the evidence gathered on LUTS in women with FGM remains inconclusive [15]. A reason may be that a large percentage of these symptoms do not come to medical attention, either because they are not reported by patients or because they are not taken into account by physicians. Further studies are needed to clarify how genital mutilation affects girls and women, and to determine the signs, symptoms, and diseases associated with FGM. Also, awareness about the urological complications of FGM should be raised among gynecologists.

The most evident limitations of the present study are its lack of data about the patients' history of the sexually transmitted diseases considered to be responsible for their LUTS [16]. Not performing urodynamic studies and relying on the results of urine analysis rather than on those of urine cultures for diagnosis of urinary tract infection are other shortcomings. Despite these limitations, the study provides a preliminary insight into the effect of FGM on the prevalence of LUTS.

In conclusion, women with FGM are significantly more likely to have LUTS than women without FGM, and LUTS seems to be more common and more extensive in those with Type II and Type III FGM.

### Conflict of interest

The authors have no conflicts of interest.

### References

- Amnesty International. What is Female Genital Mutilation? <http://www.amnesty.org/en/library/asset/ACT177/006/1997/en/373c3381-e984-11d1-8224-a709898295f2/act770061997en.pdf>. Published September 30, 1997. Accessed September 3, 2011.
- Rasheed SM, Abd-Allah AH, Yousef FM. Female genital mutilation in Upper Egypt in the new millennium. *Int J Gynecol Obstet* 2011;114(1):47–50.
- World Health Organization. Female Genital Mutilation: Report of a WHO Technical Working Group, Geneva, 17–19 July 1995. Geneva: World Health Organization; 1996.
- Obermeyer CM. The health consequences of female circumcision: science, advocacy, and standards of evidence. *Med Anthropol Q* 2003;17(3):394–412.
- Yount KM, Balk DL. A Demographic Paradox: Causes and Consequences of Female Genital Cutting in Northeastern Africa. *Adv Gen Res* 2004;8:199–249.
- Nour NM. Female genital cutting: clinical and cultural guidelines. *Obstet Gynecol Surv* 2004;59(4):272–9.
- Almroth L, Elmusharaf S, El Hadi N, Obeid A, El Sheikh MA, Elfadil SM, et al. Primary infertility after genital mutilation in girlhood in Sudan: a case-control study. *Lancet* 2005;366(9483):385–91.
- Meniru GI. Female genital mutilation (female circumcision). *Br J Obstet Gynaecol* 1994;101(9):832.
- Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardisation of terminology of lower urinary tract function: report from the Standardisation Sub-committee of the International Continence Society. *Neurourol Urodyn* 2002;21(2):167–78.
- Nour NM. Female genital cutting: a persisting practice. *Rev Obstet Gynecol* 2008;1(3):135–9.
- Barry MJ, Fowler Jr FJ, O'Leary MP, Bruskevitz RC, Holtgrewe HL, Mebust WK, et al. The American Urological Association symptom index for benign prostatic hyperplasia. The Measurement Committee of the American Urological Association. *J Urol* 1992;148(5):1549–64.
- Irwin DE, Milsom I, Hunskaar S, Reilly K, Kopp Z, Herschorn S, et al. Population-based survey of urinary incontinence, overactive bladder, and other lower urinary tract symptoms in five countries: results of the EPIC study. *Eur Urol* 2006;50(6):1306–15.
- Adekunle AO, Fakokunde FA, Odugobge AA, Fawole AO. Female genital mutilation – postcircumcision vulval complications in Nigerians. *J Obstet Gynaecol* 1999;19(6):632–5.
- Agugua NE, Egwuatu VE. Female circumcision: management of urinary complications. *J Trop Pediatr* 1982;28(5):248–52.
- Obermeyer CM. The consequences of female circumcision for health and sexuality: an update on the evidence. *Cult Health Sex* 2005;7(5):443–61.
- Prentiss KA, Newby PK, Vinci RJ. Adolescent female with urinary symptoms: a diagnostic challenge for the pediatrician. *Pediatr Emerg Care* 2011;27(9):789–94.