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ORIGINAL ARTICLE

Are obstetric outcomes affected by female genital mutilation?

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Abstract
Introduction and hypothesis Female genital mutilation (FGM) has been associated with adverse obstetric and neonatal outcomes, such as postpartum haemorrhage (PPH), perineal trauma, genital fistulae, obstructed labour and stillbirth. The prevalence of FGM has increased in the UK over the last decade. There are currently no studies available that have explored the obstetric impact of FGM in the UK. The aim of our study was to investigate the obstetric and neonatal outcomes of women with FGM when compared with the general population.
Methods We conducted a retrospective case–control study of consecutive pregnant women with FGM over a 5-year period between 1 January 2009 and 31 December 2013. Each woman with FGM was matched for age, ethnicity, parity and gestation with subsequent patients without FGM (control cohort) over the same 5-year period. Outcomes assessed were mode of delivery, duration of labour, estimated blood loss, analgaesia, perineal trauma and foetal outcomes.
Results A total of 242 eligible women (121 FGM, 121 control) were identified for the study. There was a significant increase in the use of episiotomy in the FGM group ($p = 0.009$) and a significant increase in minor PPH in the control group during caesarean sections ($p = 0.0001$). There were no differences in all other obstetric and neonatal parameters.
Conclusions In our unit, FGM was not associated with an increased incidence of adverse obstetric and foetal morbidity or mortality.

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Introduction

Female genital mutilation (FGM) is defined by the World Health Organisation (WHO) as all procedures that involve partial or total removal of the external female genitalia or other injury to the female genital organs whether for cultural or other nontherapeutic reasons [1]. The practice of FGM is common in sub-Saharan Africa and the Middle East, affecting >125 million girls [2]. FGM has been illegal in the UK since 1985. Regardless, in England and Wales, approximately 137,000 women are affected by FGM, and this figure continues to rise [3, 4], in part due to rising immigration from countries where the practice is commonplace and mandatory reporting of FGM by healthcare professionals was introduced [5]. Since 2000, the prevalence of FGM has risen by 43% in the UK [6].

In addition, nonobstetric complications, such as recurrent urinary tract infections, dyspareunia, bacterial vaginosis and impaired sexual function, and the development of psychological dysfunction, such as posttraumatic stress disorder, depression and anxiety [7], FGM has implications for future childbirth, as it is associated with an increased risk of adverse obstetric complications such as postpartum haemorrhage (PPH), perineal trauma, genital fistulae, obstructed labour and stillbirth [8–10]. The WHO literature report of health complications from FGM concluded: "the serious obstetric consequences of FGM, when it is performed prior to the index pregnancy, are mainly due to the scarring resulting from FGM" [11]. Most women with FGM live in countries with limited infrastructure for medical care and research.

Consequently, research in this area is of poor quality with divergent results, and reliable data are scarce. In addition, most studies have been conducted in the African continent, where maternal and perinatal mortality is high, and patient outcomes may not be generalisable to women in the UK.

There are currently no studies available that have explored the obstetric impact of FGM in the UK. The aim of our study was to investigate the obstetric and neonatal outcomes of women with FGM when compared with the general population in a London university hospital.

Materials and methods

This is a retrospective case–control study of consecutive pregnant women with FGM over a 5-year period between 1 January 2009 and 31 December 2013. FGM was defined as per WHO guidelines as all procedures that involve partial or total removal of the external female genitalia and or other injury to the female genital organs for nonmedical reasons. We used the classification of FGM adopted by the WHO [1]:

- Type 1: Paritail or total removal of the clitoris and/or prepuce (clitoridectomy)
- Type 2: Parital or total removal of the clitoris and the labia minora with or withour excision fo the labia majora (excision)
- Type 3: Narrowing of the vaginal orifice with creation of a covering seal by cutting and appositioning the labia minora and/or labia majora with or without excision of the clitoris (infibulation).
- Type 4: All other harmful procedures to the female genitalia for nonmedical purposes, for example: pricking, piercing, incising, scraping and cauterising.
- Deinfibuation: Cutting open the sealed vaginal opening in a woman who has been infibulated.

Each woman with FGM was matched for age, ethnicity, parity and gestational age with subsequent women without FGM (control cohort) over the same 5-year period. Data on nationality were recorded. All women had their intrapartum care and delivery at Croydon University Hospital. Patient information was collected from the perineal clinic where all antenatal women with FGM are reviewed. FGM diagnosis was defined by examination of the external genitalia and assessed by a consultant urogynaecologist or specialist perineal midwife who specialises in perineal trauma. Inclusion criteria comprised pregnant women > 18 years of age with a history of FGM. Intrapartum care was managed in accordance with National Institute for Health and Care Excellence (NICE) intrapartum guidelines [12]. Intrapartum and delivery details were retrieved from the Maternity Obstetrics PROTOS system for both cohorts of patients. Outcomes assessed included mode of delivery, duration of labour, estimated blood loss, analgaesia, perineal trauma and foetal outcomes. Perineal trauma included all perineal tears including obstetric anal sphincter injury (OASI), clitoral tears and episiotomies. Perineal tears were classified as defined by the Royal College of Obstetricians and Gynaecologists (RCOG). OASI refers to perineal damage involving the anal sphincter complex (3rd degree) or anal epithelium (4th degree) [13]. Foetal outcomes recorded included sex, birthweight, head circumference, apgar scores and placental cord gases. Postpartum haemorrhage (PPH) is defined as a loss > 500 ml of blood at delivery. Minor PPH is defined as a loss of between 500 and < 1000 ml of blood and major PPH is as a loss > 1000 ml of blood.

Statistical analysis included the chi-square test for categorical values, Student's t test for continuous parametric variables and Mann–Whitney U test for continuous and unpaired nonparametric variables. The Kolmogorov–Smirnov test was used to evaluate continuous data for normality prior to significance testing. A p value < 0.05 was considered significant. This project was approved as an audit (registration number 2014/609) by the audit committee at Croydon University Hospital.

Results

A total of 242 eligible women were identified for the study: 121 women in each cohort (FGM and control groups). There was no significant difference in baseline age ($p = 0.22$), ethnicity ($p = 0.73$), nationality ($p = 0.18$) and parity ($p = 0.98$) between groups. Participant demographics are detailed in Table 1. In the FGM group, most women were diagnosed with type 1 (31%) or 2 (45%) FGM, described in Table 2. One patient had type 4 FGM due to stretching of the labia.

There was no significant difference in gestational age at delivery, mode of delivery and choice of pain relief between groups. Instrumental delivery (ventouse and forceps) also showed no significant difference ($p = 0.68$), and there was no preference of instruments used between groups (see Table 3).

Eighty-nine women in the FGM group and 85 in the control group had vaginal deliveries, and there was no significant difference in length of labour in both 1st and 2nd stages, estimated blood loss and PPH between groups. In women who had a spontaneous vaginal delivery, there was a significant increase in the use of episiotomy ($p = 0.009$) in the FGM group and was significantly greater in primigravidas in both groups ($p = 0.003$ and $p = 0.04$, respectively). In women who had an instrumental delivery, there was no difference in perineal trauma between groups. Perineal trauma and delivery details are recorded in Tables 3 and 4.

Table 1 Demographics of women in the female genital mutilation (FGM) and control cohorts

	FGM $n = 121$ (%)	Control $n = 121$ (%)	*P* value
Age ($n \pm$ SD)	28.74 ± 6.35	29.71 ± 5.30	0.22
Ethnicity			
African	107 (89)	119 (98.3)	0.73
Asian	4 (3)	1 (0.8)	
Mixed	1 (1)	0 (0)	
Other	6 (5)	1 (0.8)	
Not recorded	3 (2)	0 (0)	
Region			0.18
- Africa	114 (94.2)	115 (95)	
Middle East	5 (41)	1 (0.8)	
Asia	1 (0.8)	1 (0.8)	
UK	0 (0)	3 (2.5)	
Carribean	0 (0)	1 (0.8)	
Unknown	1 (0.8)	0 (0)	
Parity			0.98
0	45 (37.2)	45 (37.2)	
1	37 (30.6)	37 (30.6)	
2	17 (14)	17 (14)	
3	8 (6.6)	8(6.6)	
4	6 (5)	5 (4.1)	
5	5 (4.1)	5 (4.1)	
6	1 (0.8)	3 (2.5)	
7	1 (0.8)	1 (0.8)	
8	1 (0.8)	0 (0)	

SD standard deviation

Thirty-two women in the FGM group and 36 in the control group had caesarean sections, with no significant increase in emergency sections in the FGM group. There was a significant increase in PPH ($p = 0.001$) in the control group, which was attributed to a significant increase in minor PPH ($p = 0.0001$) (Table 3). When patients with FGM type II were subanalysed, there was no difference in blood loss ($p = 0.74$). This excluded patients who had been deinfibulated.

There was no significant difference in neonatal demographics, including sex, birthweight and head circumference. Apgar scores at 1 min and 5 min were not significantly different between groups (p 0.25 and 0.44, respectively). There were two cases of shoulder dystocia in the control group and none in the FGM group. In women who had an emergency caesarean section, there was a significantly lower venous cord gas ($p < 0.001$) in the control group, with no difference in arterial samples. Neonatal outcomes are recorded in Table 5.

Table 2 Type of female genital mutilation (FGM)

Type	No. (%)
1	38 (31)
2	55 (45)
3	19 (16)
4	1 (1)
Deinfibulated	8 (7)

Discussion

This is the first reported retrospective study in the UK evaluating intrapartum and neonatal outcomes in women with FGM compared with a control group. Overall, our findings demonstrate a significant increase in the use of episiotomy in women with FGM compared with controls, with no difference in other obstetric and neonatal parameters measured.

The main strength of this study is the attainment of objective outcomes of a large cohort of FGM women when compared with a control group matched for age, ethnicity, gestation and parity. There are certain limitations to our findings: The retrospective nature restricted our information gathering, as we were confined by documentation in medical notes. This was minimised by standardised documentation of intrapartum care in our unit. Selection bias was reduced by the consecutive nature of patient recruitment.

The significant increase in use of episiotomies in women with FGM is not unexpected. FGM is associated with increased inelastic scar tissue around the introitus, which may restrict stretching of the perineum and delay the second stage of delivery [14]. It is believed that tears related to the scar tissue may be due to its decreased tensile strength [15]. Episiotomies incise scar tissue, with a resultant increase in soft tissue space, thereby expediting delivery. OASI rates were low—between 1 and 4% in both groups—and may suggest an increased vigilance exercised by staff, particularly in women with FGM, to perform an episiotomy if required and to support the perineum during the second stage of delivery to protect it [16].

There was a significant increase in minor PPH in the control group during caesarean section. This is likely a coincidence, as it is unlikely that a diagnosis of FGM would have had any bearing on abdominal surgery. Risk factors for PPH traditionally include nulliparity, prolonged labour, induction and augmentation of labour, multiple pregnancy and placental abnormalities [17, 18]. Risk factors of PPH recorded in this study include length of labour and emergency caesarean section, which showed no difference between groups. However, other contributing risk factors such as body mass index (BMI), surgical technique, difficulty of procedure and use of uterotonics were not recorded and may provide an explanation for this finding.

Our findings contradict other reports in the literature regarding the increased risk of perineal trauma, OASI and maternal morbidity secondary to FGM [15, 19, 20].

Table 3 Obstetric outcomes in female genital mutilation (FGM) and control cohorts

	FGM $n = 121$ (%)	Control $n = 121$ (%)	*P* value
Mode of delivery			0.53
SVD	77 (63.6)	71 (58.7)	0.43
Ventouse	6 (5.0)	10 (8.3)	0.30
Forceps	6 (5.0)	4 (3.3)	0.52
Emergency caesarean section	15 (12.4)	12 (9.9)	0.54
Elective caesarean section	17 (14)	24 (19.8)	0.23
Gestational age			0.94
34^{+0}–34^{+6}	1 (0.8)	1 (0.8)	
35^{+0}–35^{+6}	2 (1.7)	1 (0.8)	
36^{+0}–36^{+6}	1 (0.8)	0 (0)	
37^{+0}–37^{+6}	5 (4.1)	4 (3.3)	
38^{+0}–38^{+6}	17 (14)	15 (12.4)	
39^{+0}–39^{+6}	23 (19)	31 (25.6)	
40^{+0}–40^{+6}	37 (30.6)	37 (30.6)	
41^{+0}–41^{+6}	29 (24)	27 (22.3)	
42^{+0}–42^{+6}	6 (5.0)	5 (4.1)	
Vaginal delivery			
Analgaesia/anaesthesia			0.27
Epidural	13 (15)	18 (21)	0.26
Entonox	74 (83)	66 (78)	0.36
Spinal	0 (0)	1 (1)	0.30
Pethidine	2 (2)	0 (0)	0.16
Duration of 1st stage (min) ± SD	285.1 ± 220.0	273.4 ± 237.1	0.45
Duration of 2nd stage (min) ± SD	29.59 ± 41.88	50.46 ± 65.82	0.10
Estimated blood loss (ml) ± SD	302.27 ± 217.21	336.31 ± 241.40	0.33
PPH	9	13	0.30
Major	2	3	0.61
Minor	7	10	0.39
Caesarean section			
Anaesthesia			
Epidural	6 (19)	9 (25)	0.53
Spinal	25 (78)	24 (67)	0.29
Combined spinal + epidural	1 (3)	3 (8)	0.36
Estimated blood loss (ml) ± SD	511.29 ± 311.91	780.33 ± 579.37	**0.004**
PPH	15	30	**0.001**
Major PPH	4	5	0.87
Minor PPH	11	25	**0.0001**

Bolded data indicate statistically significant differences

SVD spontaneous vaginal delivery, *SD* standard deviation, *PPH* postpartum haemorrhage

However, most of these studies were conducted in the underdeveloped and low-resource developing countries without access to modern healthcare. A meta-analysis of 44 such studies showed no difference in episiotomy rates between women with and without FGM but did note a significant increase in obstetric lacerations in patients with FGM [14]. It has therefore been suggested that the lack of episiotomy could contribute to the occurrence of severe perineal trauma. The use of episiotomy in our cohort may have protected women from severe perineal trauma, in particular, OASI. In resource-rich countries, FGM is also associated with a worse obstetric and neonatal outcome. A retrospective case–control study of 122 women in Switzerland found a similar significant increase in emergency caesarean section and third-degree tears. The rise in caesarean sections, however, was attributed to inadequate surveillance of labour progression and was presumably attributed

Table 4 Perineal trauma in the female genital mutilation (FGM) and control groups

	FGM $n = 121$ (%)	Control $n = 121$ (%)	*P* value
Total Episiotomy	28 (31.5)	13 (15.5)	**0.01**
SPONTANEOUS VAGINAL DELIVERY			
Intact perineum	25 (32.5)	31 (44)	0.16
Clitoral tear	1 (1.5)	0 (0)	0.33
First-degree tear	11 (14)	10 (14)	0.95
Second-degree tear	19 (25)	25 (35)	0.18
Third-degree tear	3 (4)	1 (1)	0.34
Fourth-degree tear	0 (0)	0(0)	
Episiotomy only	18 (23)	4 (6)	**0.009**
INSTRUMENTAL DELIVERY			
Anterior laceration	0 (0)	1 (7)	0.35
First-degree tear	0 (0)	1 (7)	0.35
Second-degree tear	2 (17)	2 (14)	0.87
Episiotomy + Second-degree tear	6 (50)	6 (43)	0.72
Episiotomy	4 (33)	4 (29)	0.79

Bolded data indicate statistically significant differences

to the narrowed introitus [15]. A lack of knowledge and experience of healthcare professionals with regards to FGM may contribute to poorer obstetric outcomes in these cases.

In low-resource countries, a considerable number of women deliver without the assistance of a skilled healthcare professional [21]. In the West, there is wide variation in training, and FGM is not a mandatory topic in undergraduate training [22]. In Begium, only 1% of doctors were aware of their local guidelines with regards FGM [23], and most Swedish and Norwegian health professionals expressed inadequate knowledge and skills in the area [24]. In the UK, a survey of obstetricians and other health professionals in a large clinic found that 74% felt inadequately trained to deal with FGM, with only 41% having been trained in deinfibulation [25]. In a university teaching hospital, 58% were unable to list the categories of FGM and 47% believed that caesarean section was the recommended mode of delivery for patients with FGM [26]. This lack of suitably trained medical and midwifery teams undoubtedly contributes to increased adverse outcomes, with women less likely to receive good antenatal, intrapartum and postpartum care.

Table 5 Foetal outcomes in the female genital mutilation (FGM) and control groups

	FGM $n = 121$ (%)	Control $n = 121$ (%)	*P* value
Sex (%)			0.70
Female	62 (51)	65 (54)	
Male	59 (49)	56 (47)	
Birthweight (g) ± SD	3402 ± 565	3407 ± 438	0.95
Head Circumference (cm) ± SD	34.56 ± 1.50	34.23 ± 1.42	0.51
Arterial Cord Gases			
Vaginal Deliveries	7.26 ± 0.11	7.30 ± 0.77	0.11
EMCS	7.25 ± 0.06	7.24 ± 0.11	1.00
Venous Cord Gases			
Vaginal Deliveries	7.26 ± 0.07	7.24 ± 0.08	0.49
EMCS	7.30 ± 0.05	7.17 ± 0.11	**<0.001**

Bolded data indicate statistically significant differences

SD standard deviation, *EMCS* emergency caesarean sections

The RCOG has recommended that antenatal screening of women with FGM is vital for detection, intervention and prevention [13]. In our unit, midwives and obstetricians attend annual mandatory sessions on FGM. In the antenatal period, all women with FGM are reviewed in a dedicated perineal clinic. A consultant urogynaecologist and/or a specialist perineal midwife reviews patients, and a plan of care is adopted. Women with a narrowed introitus not conducive to a vaginal delivery is offered deinfibulation in the antenatal period. Midwives and obstetricians undergo regular extensive training on techniques of manual perineal support and the appropriate use of episiotomies with a view to reduce the risk of excessive perineal trauma and maternal haemorrhage.

In conclusion, contrary to the published literature, we found that with good antenatal and intrapartum care and appropriate education and training for clinical staff, FGM was not associated with an increased incidence of adverse obstetric and foetal morbidity or mortality. This finding is reassuring for women who present to other obstetric services in the UK that provide similar care.

Compliance with ethical standards

Conflicts of interests None.

Financial disclaimer None.

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