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CLINICAL ARTICLE

Demographic and delivery characteristics associated with obstetric fistula in Kigali, Rwanda ☆

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ABSTRACT

Objective: To assess the characteristics of Rwandan women undergoing surgical correction of obstetric fistula. *Methods:* A retrospective, cross-sectional study was conducted of women undergoing surgery to repair obstetric fistula as part of a program run by the International Organization for Women and Development in Kigali, Rwanda, between April 1, 2010, and February 28, 2011. Data were collected from medical records, including demographics, obstetric history, and results of the physical examination. *Results:* A total of 65 women underwent fistula surgery in the study period. Among 59 women for whom relevant data were available, 43 (73%) reported that the fetus did not survive the pregnancy during which the fistula developed. Delivery had occurred in a healthcare facility for 49 (82%) of 60 women. Delivery was by cesarean in 31 (48%) women included in the analyses. Cervicovesical or uterovesical fistula occurred more frequently among women who underwent cesarean delivery (9 [29%]) than among those who underwent vaginal delivery (3 [9%] of 34; $P = 0.04$). There was no difference in the number of fetal or neonatal deaths between the two groups ($P = 0.2$). *Conclusion:* Approximately half of the women in the sample delivered by cesarean, and these women were more likely to have a fistula involving the uterus or cervix.

1. Introduction

An obstetric fistula is an abnormal communication between the vagina and the urologic or colorectal systems caused by obstetric trauma, which results in uncontrollable loss of urine or feces. This condition is rare in high-income countries, where it arises primarily as a consequence of malignancy, radiation therapy, or surgical injury [1]. By contrast, obstetric fistula is a frequent occurrence among women living in low-income countries, where it typically develops as a result of obstructed labor and inadequate access to prenatal and intrapartum health care [2].

According to WHO, approximately 6 million women experience obstructed labor annually, resulting in 73 000 new cases of obstetric fistula worldwide [3]. Population-based figures for obstetric fistula in Sub-Saharan Africa conservatively estimate the number of new cases per year as approximately 33 000 [4]. In reality, these values probably underestimate the true occurrence of obstetric fistula because many affected women remain unidentified owing to social isolation.

The UN Millennium Development Goals aim to improve maternal morbidity and mortality by focusing on obstetric outcomes, such as the incidence of fistula. These goals have prioritized improved access to family planning and prenatal, intrapartum, and emergency obstetric care, including cesarean delivery [5]. As a result of such efforts to enhance maternal health, many indicators have already improved in some low-income countries, such as Rwanda. Data published by the United Nations Population Fund [6] indicated that contraceptive use in Rwanda increased by 7% between 2005 and 2008, and the presence of skilled attendants at births rose by 13% during the same period. The number of cesarean deliveries is also increasing, with 8% of deliveries in urban Rwandan communities occurring by this method in 2005 versus 5% in 1992 [7].

Another advance in Rwandan health care has been the introduction of a community-based health insurance system (Mutuelle de Santé) that provides voluntary health insurance for the entire population. Consequently, Rwandans can be insured for an annual premium of less than US$2 per household; as of 2006, almost 75% of the population had enrolled in this program [8].

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Improved access to health care through insurance, as well as increased availability of emergent obstetric surgical interventions, are likely to influence the presentation and type of fistula in Rwanda. Therefore, the primary objective of the present study was to describe the demographic and delivery characteristics of Rwandan women undergoing surgical repair of obstetric fistula. The secondary objective was to compare the characteristics of women with fistula who underwent cesarean delivery with those of women with fistula who underwent vaginal delivery.

2. Materials and methods

A retrospective, cross-sectional study was conducted of all women who underwent repair of obstetric fistula at one hospital during three surgical missions (each of 2 weeks' duration) run by the International Organization for Women and Development (IOWD) in Kigali, Rwanda, between April 1, 2010, and February 28, 2011. The IOWD is a non-profit organization of American physicians that is dedicated to the provision of high-quality health care for women in Rwanda, including correction of obstetric fistula. All women undergoing surgery to correct obstetric fistula were eligible for inclusion in the present study; women undergoing surgery for any other indication were excluded. Approval for the present study was obtained from the institutional review board of Women and Infants' Hospital of Rhode Island, Providence, RI, USA. Authorization was provided by the Rwandan Ministry of Health. Informed consent was not required as the present study evaluated information stored in an existing database.

Standardized forms were used to create a medical record at the time of initial evaluation. Detailed medical, surgical, and obstetric histories were collected for all patients with assistance from Rwandan medical providers who translated these histories into English for the medical record. Patients were specifically asked whether a vaginal delivery, cesarean delivery, or other event preceded the onset of their urinary or fecal incontinence. Physical examinations were completed by IOWD physicians, and standardized descriptions were used to characterize the type and location of fistula. For the present study, the IOWD medical records were summarized by B.B.W. and A.K. to assess demographics, obstetric history, fistula history, and the results of the physical examination.

Data were analyzed using Stata version 9 (Stata, College Station, TX, USA). Descriptive statistics, Student *t* tests, Wilcoxon rank-sum tests, and Fisher exact tests were performed as appropriate. Two-tailed *P* values were calculated, and $P < 0.05$ was considered statistically significant.

3. Results

A total of 65 women underwent surgery to correct a fistula during the study period. The mean age of the patients was 37 years and they had a median gravity and parity of 3 and 1, respectively. More than half were married and one-quarter were separated or divorced (Table 1). More than half were menstruating (Table 1). Almost 30% of the study population had a history of fistula repair, and 8% of these women had undergone several repairs (Table 1). Among the 65 women, 31 (48%) had a vesicovaginal fistula, 14 (22%) had a rectovaginal fistula, 9 (14%) a urethrovaginal fistula, 8 (12%) a cervicovesical fistula, 7 (11%) a bladder neck fistula, 4 (6%) a uterovesical fistula. A total of 43 (73%) of the 59 women for whom data were available reported that the fetus did not survive the labor during which fistula developed. The fistula developed after delivery in a healthcare facility in 49 (82%) of 60 women.

In all, 31 (48%) women had developed fistula after cesarean delivery, whereas the remaining 34 (52%) reported that they had delivered vaginally. No statistically significant between-group differences were detected in age, gravidity, parity, history of infectious disease, marital status, or age at first delivery (Table 2).

Type of fistula was associated with route of delivery. Cervicovesical or uterovesical fistula occurred more often among women who underwent cesarean (9 [29%]) than among those who had a vaginal delivery (3 [9%]; $P = 0.04$). By contrast, rectovaginal fistula was more frequent among women who underwent vaginal delivery than among those who underwent cesarean delivery ($P = 0.006$) (Table 2). No difference was found in the number of fetal or neonatal deaths between women who delivered by cesarean (23 [74%]) and those who delivered vaginally (20 [59%]; $P = 0.2$).

Unsurprisingly, women who had a cesarean delivery gave birth in a healthcare facility more often than did women who delivered vaginally (31 [100%] vs 18 [53%]; $P < 0.001$). Women who underwent cesarean delivery were also more likely to report a history of concurrent or subsequent hysterectomy than were those who delivered vaginally (10 [32%] vs 2 [6%]; $P = 0.006$).

Table 1
Demographic characteristics.[a,b]

Characteristic	Women who underwent obstetric fistula surgery (n = 65)
Age, y[c,d]	37 (20–66)
Gravity	3 (0–12)
Parity[e]	1 (0–7)
Marital status[d]	
Married	35 (56)
Separated	12 (19)
Divorced	4 (6)
Widowed	3 (5)
Never married or single	8 (13)
Age at first delivery, y[f]	21.6 ± 3.7
Menstruating[g]	
Yes	28 (54)
No	23 (44)
Postmenopausal	1 (2)
Had undergone previous fistula repair	
Yes	19 (29)
No	46 (71)
Previous fistula repairs [h]	
0	44 (70)
1	14 (22)
2	4 (6)
3	1 (2)

[a] Values given as number (percentage), median (range), or mean ± SD, unless indicated otherwise.
[b] Data for the entire cohort were unavailable for some of the characteristics assessed.
[c] Value given as mean (range).
[d] n = 62.
[e] n = 64.
[f] n = 47.
[g] n = 52.
[h] n = 63.

4. Discussion

The average age of women in the present study was 37 years. Most women were married and approximately 54% continued to menstruate. The median gravity was 3 and mean age at first delivery was 22 years. Of Rwandan women who reported symptoms of fistula, almost half had undergone cesarean delivery. These women were more likely to have delivered in a healthcare facility, report a history of hysterectomy, or have a fistula involving the uterus or cervix than were women with symptoms of fistula who had experienced vaginal delivery. No differences in fetal or neonatal outcomes were detected between the two groups.

Women in Rwanda are undoubtedly affected by the multitude of social, cultural, and economic factors that result in obstetric fistula in other low-income countries. Nevertheless, improved access to operative deliveries through the Rwandan national health insurance scheme and other initiatives might have influenced the use of cesarean delivery and, consequently, the types of fistula detected among the women who presented for obstetric fistula evaluation in Kigali.

In the present study, 82% of women affected by obstetric fistula had delivered in a medical facility. However, owing to the retrospective