Factors Associated with Obstetric Fistula Repair Failure among Women Admitted at Gynocare Women's and Fistula Hospital in Kenya, 2012-2016: A Case Control Study

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ABSTRACT

Aim: To determine factors associated with obstetric fistula repair failure at Gynocare Women's & Fistula Hospital in Kenya.

Methods: This is a case-control study of patients who underwent fistula repair at Gynocare from January 2012 to December 2016. Total of 357 patients (119 cases and 238 controls) were taken by simple random sampling.

Results: Study participants were mostly married (62.2%) with low or no formal education (90.1%). Delivery that led to fistula development occurred in the hospital for 85.2% of the study participants and 66.7% had Cesarean Section. Only one-third (120) had previous repair(s). Patients classified to have VVF IIA were 20.5%, class IIB were 35.0% and class III were 9.2%, and the rest (35.3%) were classified as class I. The odds of repair failure were 2.9 times more among those with previous repair attempts compared to those with no previous repair attempts. Women with VVF IIB were 4 times more likely to develop failure. While women who attained at least secondary education were 77% less likely to have fistula repair failure.

Conclusion: After controlling the effects of age, marital status, comorbidities, parity, time to repair, post-operative complications, having not attained at least secondary education level, having previous repair attempts, and VVF IIB were found to be independent predictors of repair failure.

Key words: Failure, Kees Waaldjik, Obstetric Fistula, Obstetric Fistula Classification, Repair

INTRODUCTION

Obstetric fistula is an abnormal communication that connects a woman's bladder or rectum with the birth canal, leading to continuous leakage of urine and/or stool.[1,2,3] The ensuing smell subjects these women to stress and low self-esteem leading to isolation from spouses, relatives and friends, and subsequently depression and poverty.[3,4]

Obstetric fistula is predominantly caused by obstructed labor and mainly affects the poor and marginalized women in developing countries who are unable to access basic health care due to among other things, weak health systems and the three-delay model.[5,6] Other causes include teenage pregnancies, female genital mutilation, sexual assault and surgical trauma.[1,7]

Currently there is no internationally acceptable classification of obstetric fistula though several classifications exist.[8] Since this study was based on review of records, we adopted the classification that was in use at the hospital, that is, Kees Waaldijk fistula classification.[9]

Reconstructive surgery is the main treatment option. Rates of failure of obstetric fistula repair have been reported to range between 5-20%[10] which correspond to a number between 150 and 600 per year and this varies from centre to centre. Despite successful repair, stress incontinence occurs in 16-32% of patients due

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to residual damage.[11]

Repeat surgery for a fistula that has not been closed represents an additional social and economic burden for the woman and fistula care programs as well as reduced likelihood of successful closure with subsequent repair attempts. Results from this study aim at ascertaining the non-randomness of the failure and identify some factors associated to it.

Specifically the study aims to describe socio-demographic characteristics of women undergoing obstetric fistula repair, the obstetric characteristics of women undergoing obstetric fistula repair and to evaluate the influence of obstetric and socio-demographic characteristics of women undergoing fistula repair on obstetric repair failure.

METHODS

It was a hospital based case control study of failed and successful VVF repair after 14 days of surgery at Gynocare Women's and Fistula Hospital, Eldoret town, Uasin Gishu County, Kenya. Simple random sampling was used to select cases and controls using computer generated random numbers after chronologically compiling the cases from record in between 1st January 2012 and 31st December 2016.

STATA/MP 13 was used to code, clean and analyze the data. Categorical variables were tabulated in form of frequencies and proportions and results displayed in tables and bar graphs. For continuous variables data distribution was assessed by use of histogram and Shapiro-Wilks W test. Measures of central tendency and dispersion were used where appropriate and summaries presented in tables.

Bivariate analysis was carried out to check for association between variables; Chi-squares/ Fisher's exact tests and Independent samples t-test/ Mann-Whitney U tests were used respectively for categorical versus categorical and categorical versus numerical variables. Logistic regression was used to measure association, predict outcome, and control for confounding variables effects. Predictors included in the model were those that had a p-value of ≤ 0.20 at bivariate level. All test statistics were done at alpha significance level of 0.05.

Ethical Approval was obtained from Ethical Review Committee of Kenyatta National Hospital/University of Nairobi (KNH/UoN) and Management of Gynocare Women's and Fistula Hospital. Waiver of consent from the patients was sought from the Ethical Review Committee (ERC).

RESULTS

The results presented here are based on 119 cases (patients who had unsuccessful repair) and 238 control (patients with successful repair) giving a total of 357 [Figure-1].

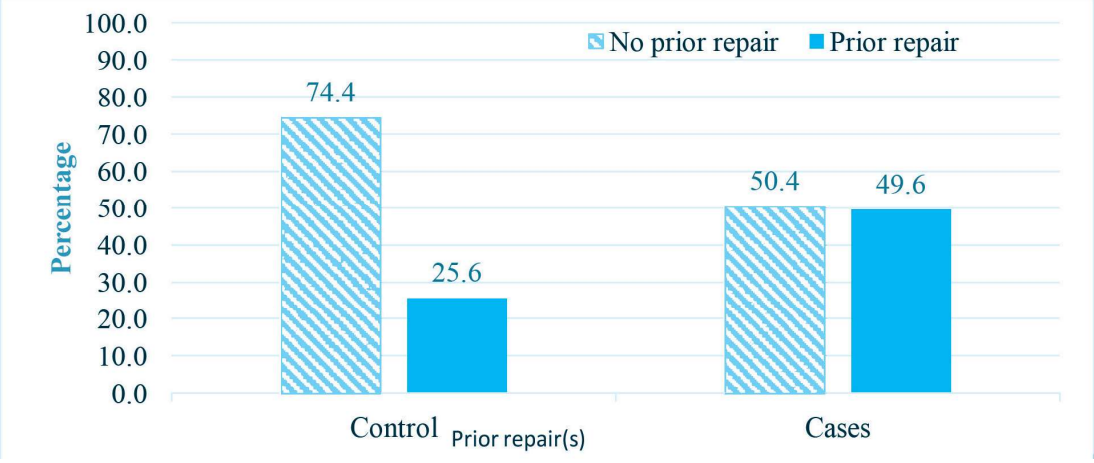

Figure 1: Distribution of prior repair cases among cases and controls

Married women were more (65.2%) among the controls compared to cases (56.5%); however the proportion of single, divorced and separated was high among cases than controls. The proportion of those who had attained high education level (secondary and college) was higher (12.7%) among the controls than cases (4.5%).

Whether patients had other comorbidities, there was a difference of 5% among the control and cases. Mode of delivery seemed to have almost equal proportions among control and cases. While only 25.6% of the control had prior repair(s) compared to 49.6% among the cases. In addition, proportion of those with VVF class IIB was high (53%) among cases than control (26%) [Table-1 and Figure-2].

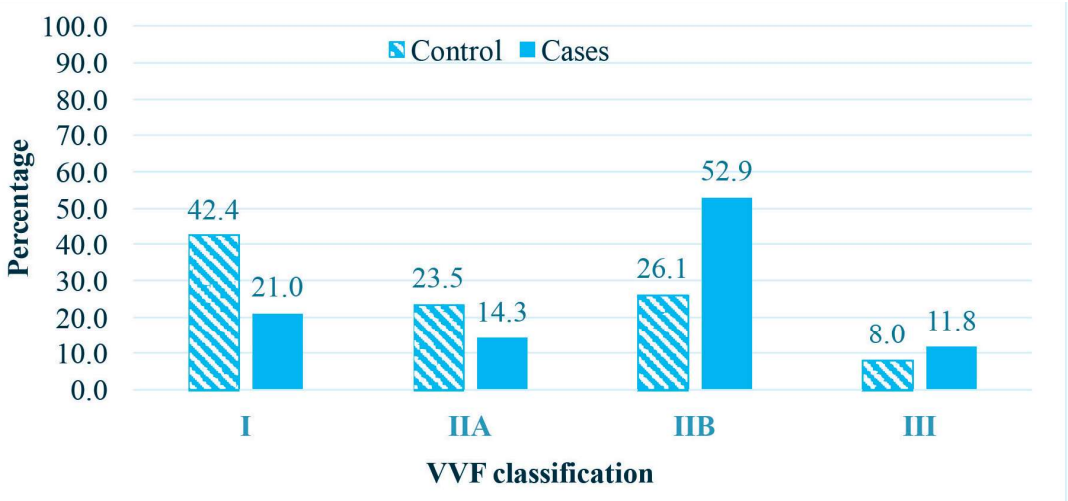

Figure 2: Distribution of VVF Classification among cases and controls

Obstetric Fistula occurred more in primi-gravidas as compared to multi-parous in both cases and controls. The post-op complication captured most was infections where cases had higher proportion (4.2%) compared to controls (1.7%).

The average length of hospitalization was 17 days for controls and 21 days for cases. The median age of Fistula development was 21 years for both controls and cases while the median age of repair was 30 for controls and 31 for cases.

Association between education level of patients and outcome of treatment was statistically significant ($\chi 2$ (2) = 12.43, p=0.002) where proportion of highly educated (secondary/college) was higher among the controls (12.7%) compared to cases (4.5%). Though not statistically significant, the proportion of married women was higher among control compared to cases but the proportions of single, divorced, and widowed were higher among cases than controls [Table-1].

Table 1: Association between social demographic characteristic and treatment outcome

Variable	Categories	Cases n (%)	Controls n (%)	p-value
Marital status (n=331)	Married	65 (56.5)	141 (65.2)	0.158
	Single	26(22.6)	47(21.8)	
	Divorced/Separated	13(11.3)	11(5.1)	
	Widowed	11(9.6)	17(7.9)	
Education	None	43 (48.3)	46 (27.9)	0.002
level (n=254)	Primary	42 (47.2)	98 (59.4)	
	Secondary/College	4 (4.5)	21 (12.7)	
Chi square test				

There was a significant association between having a previous repair attempt and outcome of repair $\chi 2$ (1) = 20.39, p<0.001, where the proportion of those who had previous repair attempts was high (49.6%) among cases compared to among the controls (25.6%). In addition VVF classification was also found to be significantly associated with treatment outcome $\chi 2$ (1) = 16.00, p<0.001 [Table-2].

Table 2: Association between obstetric characteristics/history and outcome

Variable	Categories	Control n (%)	Cases n (%)	p-value
Presence of other	No	211 (88.7)	99 (83.2)	0.150
comorbidities (n=357)	Yes	27 (11.3)	20 (16.8)	
Place of birth at development	Hospital	203 (86.4)	96 (82.8)	0.369
of fistula (n=351)	Home	32 (13.6)	20 (17.2)	
Delivery mode at fistula	C/S	158 (67.0)	76 (66.1)	0.621
development (n=351)	SVD	53 (22.5)	23 (20.0)	
	Assisted	25 (10.6)	16 (13.9)	
Previous repair attempts	No	177 (74.4)	60 (50.4)	<0.001
(n=357)	Yes	61 (25.6)	59 (49.6)	
VVF classification	I	101 (42.4)	25 (21.0)	<0.001
(n=357)	IIA	56(23.5)	17(14.3)	
	IIB	62(26.1)	63(52.9)	
	III	19 (8.0)	14 (11.8)	
Parity at development	1	111(53.1)	54(51.9)	0.099
of fistula (n=313)	2 (low multipara)	26(12.4)	18(17.3)	
	3 (multipara)	16(7.7	14(13.5)	
	4-11(grand multipara)	56(26.8)	18(17.3)	
Repair technique (n=357)	Transvaginal	205 (86.1)	97 (81.5)	0.254
	Transabdominal	32 (13.5)	20 (16.8)	
Post-op	No	232 (97.5)	111 (93.3)	0.054
complication(n=357)	Yes	6 (2.5)	8 (6.7)	
Chi square test				

On average cases took relatively longer time before repair (5.6, IQR 1.1, 17.1) compared to controls (3.8; IQR: 0.5, 15.8) although this difference in median time was not statistically significant [Table-3].

Table 3: Association between obstetric characteristics and treatment outcome

Variable	Study groups	Median(IQR)	p-value
Age at repair	Controls (n=234)	30(21, 39)	0.178
	Cases (n=113)	31(21, 45)	
Years with fistula	Control (n=232)	3.8(.5, 15.8)	0.081
	Cases (n=115)	5.6(1.1, 17.1)	
Age at development	Control (n=230)	21(17, 29)	0.777
of fistula	Cases (n=109)	21(17, 27)	
Length of	Control (n=238)	17(16, 20)	<0.001
hospitalization	Cases (n=119)	21(18, 25)	
Wilcoxon rank-sum (Mann-Whitney U) test			

Controlling for age at repair, marital status, education level, comorbidities, parity, time to repair, VVF classification and post-op complications women with previous repair attempts were 2.9 times more likely to have fistula closure failure compared to a woman who had no previous repair.

Women with VVF class IIB were 4 times more likely to develop closure failure compared to those classified to have VVF class I after adjusting for age at repair, marital status, education level, comorbidities, parity, time to repair, previous repair attempts, and post-op complications.

Adjusting for age at repair, marital status, comorbidities, parity, time to repair, previous repair attempts, VVF classification and post-op complications a woman who had attained at least secondary level of education was 78% less likely to have fistula closure failure compared to a woman who did not attend formal education [Table-4].

Table 4: Association between factors/covariates and treatment outcome (fistula closure)

		Fistula closure (0=yes, 1=no)			
Factor	**Category**	**Crude OR**	**95% CI**	**Adj. OR**	**95% CI**
Age at repair	Covariate	1.01	0.99, 1.02	0.98	0.92, 1.06
Marital status	Married	1		1	
	Single	1.20	0.68, 2.10	1.09	0.49, 2.42
	Divorced/separated	2.56	1.09, 6.02	1.68	0.56, 4.98
	Widowed	1.40	0.62, 3.16	0.48	0.08, 2.51
Education					
level	None	1		1	
	Primary	0.45	0.26, 0.79	0.49	0.23, 1.04
	Secondary +	0.20	0.06, 0.64	0.23	0.05, 0.99
Comorbidities	No	1		1	
	Yes	1.57	0.84, 2.95	0.89	0.31, 2.49
Parity	1	1		1	
	2 (low multipara)	1.42	0.71, 2.81	1.95	0.73, 5.22
	3 (multipara)	1.79	0.81, 3.95	3.19	0.85, 11.99
	4-11 (grand multipara)	0.66	0.35, 1.23	1.43	0.38, 5.38
Time to repair	Covariate	1.01	0.99, 1.03	1.01	0.94, 1.09
Previous repair					
attempts	No	1		1	
	Yes	2.85	1.79, 4.53	2.91	1.46, 5.80
Classification	I	1		1	
	IIA	1.22	0.61, 2.46	1.40	0.48, 4.06
	IIB	4.10	2.34, 7.19	4.08	1.74, 9.54
	III	2.97	1.31, 6.74	2.31	0.68, 7.88
Post-op					
complication	No	1		1	
	Yes	2.78	0.94, 8.22	2.12	0.39, 11.35

Logistic Regression

DISCUSSION

The findings on demographic characteristics of women with obstetric fistula in this study which includes; (73.5%) being under 40 years and (47.8%) between 14 – 29 years, and majority (90.2%) having no formal education/primary level education were consistence with other studies.[3,12,13] However married women were majority with a minority indicating to have been divorced or separated. Though in 2016, Delamou

and his team3 found the same proportion (61%) to be married women, another study[14] found otherwise. We found, as others[14-16] have, no relationship between demographic characteristics such as age, marital status and failure of fistula closure. However education level was found to be independently associated with outcome of fistula repair in our study.

This study adds on to the literature[17] evidence of no significant association between comorbidities and fistula closure failure. This could be an indication of independence of fistula repair outcome from other comorbidities, and gives equal grounds of successful repair regardless of the associated medical conditions. In addition our study found higher proportion of women who delivered in the hospital at the time of fistula development which mostly resulted into either Caesarian Section (C/S) or assisted delivery compared to a recent study.[15] Though not confirmed, this would be because of long hours of labor at home or under the help of Traditional Birth Attendant (TBA) and only sought help at the health facility when Spontaneous Vertex Delivery (SVD) seemed impossible.

A third of the study population had at least 1 prior repair which was not successful, this is comparable to a study by Munoz and his team.[16] Prior repair significantly predicted failure of fistula repair as supported by other studies.[13,15,17,18] Arguably this could be because of reduced viable tissues and scarring after the initial repair. Also interference with closing mechanism during repair could be a probable explanation.

According to Frajzyngier[11], vaginal route of repair is associated with an increased risk of failure of fistula closure, but in this study, no significant association was found between fistula closure and route of repair. However we found a significant association (not shown) between the route of repair and fistula classification, where fistulas not involving closing mechanism (III & I) were more likely to be repaired through abdominal route in comparison to those involving closing mechanism (II) which were more likely to be repaired through vaginal route. Consequently many studies[13,14,17] have found evidence on the role of closing mechanism in predicting failure to closure after fistula repair of which our study adds on to this literature. This study found fistula classification II to significantly predict failure of fistula repair. Further analysis indicated that, compared to classification I, fistulae classified as IIB (IIBa and IIBb) were the ones predicting closure failure).

CONCLUSIONS

Having not attained at least secondary education level, having previous repair attempts, and VVF class IIB were found to be independent predictors of fistula repair failure.

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