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Original Research Article

Magnitude of repair failure and associated factors among women undergone obstetric fistula repair in Bahir Dar Hamlin Fistula Center, Amhara Region, Northwest Ethiopia

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ABSTRACT

Background: Globally, prevention and repair of obstetric fistula remains a challenge, Ethiopia is one of the high-burden countries that constitute to the high fistula belt in the world.
Methods: Cross sectional study was conducted from 1st April 2018 to 1st May 2018 on women who had undergone obstetric fistula repair from 1st January 2013 to 30th December 2017. Systematic sampling technique was applied to select a total of 385 study participants. Data were collected by reviewing clients' cards using pre-tested questionnaire. Binary and multivariate logistic regression was conducted using SPSS version 21.0 statistical software.
Results: The magnitude of fistula repair failure was 35.3%. Women weighing <50 kgs (AOR=3.43, 95% CI: 1.89, 6.23), home delivery (AOR=2.40, 95%CI: 1.38, 4.18), labour for >2 days (AOR=3.22, 95%CI: 1.75,5.91), >3 cm width of fistula (AOR=2.30, 95%CI: 1.27, 4.17), grade three fistula (AOR=3.26, 95%CI: 1.29, 8.27), grade four fistula (AOR=9.76, 95%CI: 3.71, 25.67), complete destruction of bladder neck (AOR=2.70, 95%CI: 1.07, 6.66) and post operation infection (AOR=2.98, 95%CI: 1.56, 5.70) were associated factors with fistula repair failure at p value <0.05.
Conclusions: Caution should be taken for obstetric fistula repairing women who presented with less than 50 kg, home delivered, greater than two days labour, greater than 3 cm width of fistula, grade 3 and 4 fistulas, complete destruction of the bladder neck and post-operative infection.

Keywords: Fistula repair failure, Pregnant women, Bahir Dar

INTRODUCTION

Obstetric fistula is a maternal morbidity with devastating effects on a woman's life, persisting in low-income countries but virtually eliminated from the morbidity burden in high- and middle-income countries.[1] Today, obstetric fistulas have vanished from the developed world and occur almost exclusively in the non-industrialized countries of Africa and Asia, where access to quality medical care is lacking for many (perhaps most) women. The disappearance of this condition of the developed countries is largely the result of universal access to emergency obstetric care.[2]

In parts of sub-Saharan Africa and Asia it was estimated that more than 2 million young women live with untreated obstetric fistulas. It has also been estimated that between 50,000 and 100,000 new women are affected each year, and particularly in Ethiopia it was estimated

that 9,000 women annually develop a fistula of which only 1,200 are treated.[3]

Ethiopia is one of the high-burden countries that constitute to the fistula belt in the world. The magnitude of obstetric fistula in Ethiopia was 2.2 per 1000 women of reproductive age.[4] In low and middle income countries in 2005 more than 500,000 women were dying as a result of complication.[5] And those women who live with fistula suffer in physical, social, economic and psychological impact on affected women, their husbands, children and friends. Many women are divorced from their husbands and partners, disowned by family, stigmatized by friends and even isolated from health workers.[6,7] Because of the smell of urine, women suffering of fistula are often abandoned by their spouses and relatives, keeping victims in poverty and loneliness, due to this they suffer from clinical depression and suicide themselves.[8,9]

Failure of fistula closure was associated with vaginal delivery, total or partial damage of the urethra were more likely to experience post-repair urinary incontinence than women who had their urethra intact.[10] Vaginal scarring and urethral involvement were also associated with poor prognosis of fistula repair.[11]

To overcome the burden fistula, holistic care approach (prevention, treatment and reintegration) is necessary. The holistic care approaches of obstetric fistula failure in many sub-Saharan African countries have improved. Surgical closure rates were reported to be as high as 90%; however, this achievement varies from one repair hospital to another and from different in different countries, due to repairing technique, surgical experienced, fistula characteristics and post-operative nursing care.[11,12] In Zambia fistula repair failure was ranging from 7% to 13%.[13] And other studies in African countries on fistula repair failure results that ranged from 5% to 30%.[8,14]

Due to failure of fistula repair, women are exposed to repeated surgery and this leads to additional social and economic burden on the woman and fistula care programs as well.[15] In addition, women who had repeated surgery could frequently be exposed to medical complications such as infection, pain, sexual dysfunction and secondary infertility.[12,16]

Evidences show that there is a decline in the number of Ethiopian women being treated for new obstetric fistula. But the type of fistula being presented for treatment is changing, with a rise in high fistula and a decline in the classic low fistula that arise following obstructed childbirth; because of this fistula repair failure rate might be high in Ethiopia.[17]

But investigators of this research didn't get documented findings regarding obstetric fistula repair failure in Amhara region. Therefore, this study was conducted to assess the magnitude of fistula repair failure and factors associated with repair failure in Bahir Dar Hamlin fistula center. The finding will be useful to improve the implementation and performance of fistula care programs, and contribute to improve the quality of services at repair.

METHODS

Study period and study settings

The study was conducted from 1st March 2018 to 30th April 2018. The study was conducted in the Hamline fistula center at Bahir Dar City, the capital of the Amhara Region, 540 km northwest of Addis Ababa. Bahir Dar is situated on the southern tip of Lake Tana, the source of the Blue Nile River. Currently, the city has two public hospitals, three private hospitals and 10 health centers that provide maternal and child health care service.[18]

Hamlin Fistula-Ethiopia (a charitable organization founded by Dr. Catherine Hamlin and her late husband Dr. Reginald) had one main hospital in Addis Ababa and five outreach centers in different regions across the country, and Bahir Dar Hamlin fistula center is one of the outreach centers. As the information obtained from the head of the center, the center had opened in 2007 at the compound of the Felege Hiwot Referral Hospital. The center provides fistula surgery, care and treatment is completely free of charge. Transport costs and any rehabilitation needs are also being catered for each woman. The service was being provided by one medical doctor, two nurses, one health officer, one midwifery and 23 trained aid nurses; and the center has 45 beds.

Study design

Retrospective review of patient follows up cards.

Sample size determination

To determine the sample size, single proportion formula was implemented, assuming that the proportion of fistula repair failure was 50% (since there were no documented fistula failure studies in the study area), margin of error 5% and 95% CI. Thus, the sample size was calculated as:

$$n = \frac{(\mathrm{Z}\alpha/2)^2\ (\mathrm{P}(1-P))}{\mathrm{d}^2}$$

where: n=sample size required=385, P=proportion of fistula repair failure=0.5, d=margin of error=0.05, Zα/2=1.96

Sampling technique and procedure

The total clients underwent for fistula repair surgery in the past 5 years was 891 women; i.e., 206, 203, 190, 184 and 108 in 2013, 2014, 2015, 2016 and 2017 respectively. For systematic sampling purpose women who received an OF repair during each year were recorded in sequential order; and medical records of each

woman were selected by systematic sampling technique in each year after proportional allocation. Incomplete woman's cards (that didn't fulfill our questionnaire) were skipped and the next card was considered (Figure 1).

Operational definitions

Obstetric fistula or vaginal fistula

Obstetric fistula (OF) or vaginal fistulais a fistula (hole) developed between the rectum and vagina (recto vaginal fistula) or between the bladder and vagina (Vesico-vaginal fistula).[19]

Obstetric fistula repair

A women considered as OF repaired when the hole was closed and continence within 21 days following obstetric fistula surgery procedure.[2]

Obstetric fistula repair failure

A woman was considered as OF repair failure when the hole was not closed and/or incontinent after 21 days of the fistula repairing surgery procedure.[2]

Data collection instrument and method

Data were collected through document review by using pre-tested questionnaire adapted from different literatures. It contains socio-demographic information, obstetric information, fistula history and care related questions. Three midwifery professionals for data collection and one BSc nurse for supervision were participated after provision of relevant training.

Data quality assurance

To ensure the quality of data collectors and the supervisor was trained thoroughly for two days. The questionnaire was pretested among 19 women underwent to fistula repair in 2012. A unique code was given for each questionnaire. Completeness and consistency of the questionnaire were checked on a daily basis by the supervisor.

Data entry and analysis

The data were entered into using Epi-info version 7; and any inconsistencies and missing values were cleaned prior to analysis. Any error identified was immediately corrected via back, tracing the coded original data.

Data analysis was conducted by using SPSS version 21.0 statistical software. Women whose fistula didn't close and or incontinence within 21 days after repairing surgery was considered as "obstetric fistula repair failure" and coded as yes or 1 and Women whose fistula was closed and continence within 21 days after repairing surgery was considered as "obstetric fistula repaired" and coded as "no" or 0 for the analysis. Bivariate and multivariate logistic regression analysis was conducted. Variables with p value <0.20 in the bivariate regression analysis have passed into multivariate logistic regression. And independent variables with p value <0.05 in multivariate logistic regression were considered to have a statistically significant association with the outcome variable.

Ethical approval

Oral permission was obtained from the Director of Bahir Dar Hamlin Fistula Center. For the purpose of confidentiality, all records were kept secured and only data collectors, the supervisor and investigators were allowed to have access to it. The data collectors and the supervisor were informed not to disclose any private information's of women during data collection.

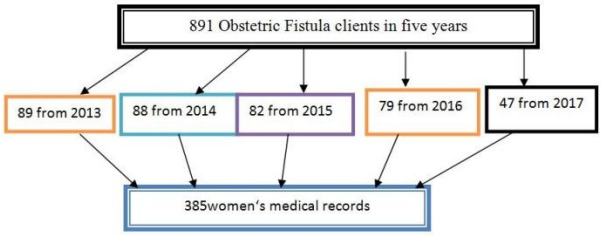

Figure 1: Sampling procedure for OF repair failure among women undergoing OF repair surgery.

RESULTS

Socio demographic characteristics

Three hundred and eighty five medical records (100% response rate) of women underwent surgical repair for OF repairing were analyzed. The majority of women, 77.9%, were in the age range of 20-40 years at the time visit for fistula repairing surgery, and their mean age was 30.2 years (with SD±9). Among women who underwent fistula repairing surgery, 27.3% were married before celebrating their 15th years of age. Out of the total women, 88.3% of them were Christian religious followers and the rest 11.7% were Muslim. Regarding residence, 84.7% women was living in rural areas. Among all women who underwent fistula repair surgery, 77.9% of them cannot read and write. The weight of 58.4% of women was less than 50 kg during repair surgery (Table 1).

Obstetric history

Among women who had undergone OF repair 63.1% had ANC follow up and 60.3% of them had delivered at health institutions. Among women who delivered in health institutions, 28.6% had delivered through cesarean section. Regarding the duration of labor of women who had undergone repair, 30.4% were laboring for more than two days; and 33.3% of them had borne three and more children (Table 2).

Fistula characteristics

Among women who visited for OF repairing surgery, 87.3% underwent for fistula repairing due to vesicovaginal fistula (VVF), 10.6% due to rectovaginal fistula (RVF) and 2.1% had visited due to both VVF and RVF fistula. About 28.6% have a width of fistula greater than 3 cms. More than 50% of women who visited for repairing surgery were affected by grade 3 and 4 fistula. Among women who underwent repairing 24.8% had developed incontinence. Regarding bladder neck, 31.2% and 12.5% of women had partially damaged and completely destructed bladder neck respectively. Moreover, 22.6% and 11.7% of women had moderate and severe vaginal scar respectively (Table 3).

Table 1: Socio-demographic characteristics of women underwent OF repair.

Variables		Frequency	Percentage (%)
Religion	*Christian	340	88.3
	Muslim	45	11.7
Ethnicity	Amhara	369	95.8
	*Others	16	4.2
Marital status	Married	314	81.6
	Divorced	54	14
	Single	17	4.4
Residence	Rural	326	84.7
	Urban	59	15.3
Educational status	Can't read and write	300	77.9
	Can read and write	85	22.1
Age at repairing	≤20	45	11.7
	20-40	300	77.9
	>40	40	10.4
Age at first marriage	<15 year	105	27.3
	15- 19 years	257	66.8
	≥20 years	23	6.0
Age at development of fistula (in years)	≤19	67	17.4
	20-40	307	79.7
	>40	11	2.9
Weight in Kg at repairing	<50	225	58.4
	≥50	160	41.6
Height at repairing	<150	182	47.3
	≥150	203	52.7

*Other-includes ethnic groups Agew, Gumuz, Tigrai and Oromo.
*Christian-includes orthodox, catholic and protestant.

Table 2: Obstetric history of women underwent OF repair.

Variable		Frequency	Percentage (%)
ANC follow up	Yes	243	63.1
	No	142	36.9
Place of delivery	Home	153	39.7
	Health institution	232	60.3
Mood of delivery	Spontaneous vaginal	222	57.7
	Assisted vaginal	53	13.8
	C/S*	110	28.6
Duration of labor	≤2 days	268	69.6
	>2 days	117	30.4
Parity	One	168	43.6
	Two	89	23.1
	Three	74	19.2
	Four and above	54	14.1

*C/S: Cesarean section.

Fistula repairing and care related variables

Among all women who had undergone fistula repair, 35.3% women had an unsuccessful fistula repair (fistula repair failure). Among the unsuccessful fistula repair 39.7% had an unclosed fistula repair and 60.3% had closed repairs, but remaining incontinent after 21 days of repairing surgery.

Majority of OF repairing surgery, 91.4%, was performed by senior gynecologists; and 96.4% of surgeries were done through trans- vaginal technique. Among women who visited for OF repairing surgery, 21.6% had developed an infection after repairing (Table 4).

Table 3: Fistula characteristics of the women underwent OF repair.

Variable		Frequency	Percentage (%)
Type of fistula developed	VVF only	336	87.3
	RVF only	41	10.6
	Both VVF and RVF	8	2.1
Width of fistula hole	≤3 cms	275	71.4
	>3 cms	110	28.6
Classification of fistula	Grade 1	67	17.4
	Grade 2	123	31.9
	Grade 3	90	23.4
	Grade 4	105	27.3
Status of urethra	Intact	238	61.8
	Partial damage	95	24.7
	Complete destruction	52	13.5
Status of bladder neck	Intact	217	56.4
	Partial damaged	120	31.2
	Complete destruction	48	12.5
Presence of incontinence	Yes	82	24.8
	No	249	75.2
Previous fistula attempts	Yes	11	2.9
	No	374	97.1
Status of vaginal scar	No scar	18	4.7
	Mild scarring	235	61.0
	Moderate scar	87	22.6
	Sever scar	45	11.7

Table 4: Fistula repairing outcome of the women underwent OF repair.

Variables		Frequency	Percentage (%)
Repaired fistula closed (n=385)	Yes	331	86
	No	54	14
Closed fistula continent (n=331)	Yes	249	75.2
	No	82	24.8
Fistula repair failure	Yes	136	35.3
	No	249	64.7
Repair Failed fistula (n=136)	Unclosed	54	39.7
	Incontinent	82	60.3
Repairing done by	Senior gynecologists	352	91.4
	Guests & Resident gynecologists	33	8.6
Infection after repairing	No	302	78.4
	Yes	83	21.6
The technique used to repair fistula	Trans - vaginal	371	96.4
	Trans - abdomen	11	2.9

Determinant factors to fistula repair failure

Bivariate and multivariate logistic regression analysis was performed to assess factors associated for fistula repair failure. In bivariate analysis, variables such as parity, weight of women at repairing, place of delivery, width of fistula, status of bladder neck, fistula classification, duration of labor, status of vaginal scar, and post operation infection have a statistically significant association with the failure of fistula repair at p value <0.20.

Variables that have a statistical association for failure of fistula repair under bivariate analysis were passed to multivariate logistic regression analysis. Weight of women at repairing, place of delivery, duration of labor, width of fistula, fistula classification, status of the bladder neck and presence of post operation infection had statistically associated with failure of fistula repairing at p value <0.05.

Among fistula repairing women whose body weight were <50 kg were 3.43 times more likely to fail after repairing (AOR=3.43, 95%CI: 1.89, 6.23) compared to women of their counterparts. Fistula repairing women who delivered at home were 2. 40 times more likely to be exposed for repair failure (AOR=2.40, 95%CI: 1.38, 4.18) compared to women delivered at health institutions. The fistula repairing of women labored for more than 2 days were 3.22 times more likely to fail (AOR=3.22, 95%CI: 1.75, 5.91) compared to those who labored for at most 2 days. Among fistula repairing women whose width of fistula was greater than 3 cm were 2.30 times more likely (AOR=2.30, 95%CI: 1.27, 4.17) to fail after repairing compared to their counterparts. Fistula repairing of women with grade three and four of fistula were 3.26 times (AOR = 3.26, 95%CI: 1.29, 8.27) and 9.76 times (AOR=9.76, 95%CI: 3.71, 25.67) more likely to fail compared to grade 1 fistula classes. Among women who undergone fistula repairing, those who had complete destruction of bladder neck were 2.70 times (AOR=2.70, 95%CI: 1.07, 6.66) more likely to experience repairing failure compared to women who had an intact bladder neck. Fistula repairing women who were exposed for post operation infection were about 3 times more likely to experience repairing failure (AOR=2.98, 95%CI: 1.56, 5.70) compared to their counterparts (Table 5).

Table 5: Factors associated with fistula repair failure among women underwent OF repair.

Variable		Fistula repair failed		COR, 95%CI	AOR, 95%CI	P value
		Yes	No			
Parity	One	70	98	2.25 (1.12,4.52)*	1.10 (0.43,2.82)	0.843
	Two	30	59	1.60 (0.75,3.44)	1.22 (0.44,3.39)	0.700
	Three	23	51	1.42 (0.64,3.15)	1.16 (0.41,3.30)	0.784
	Four and above	13	41	1.0	1.0	
Weight at repairing	<50 kgs	101	124	2.91 (1.84,4.60)*	3.43 (1.89,6.23)**	0.000
	≥50 kgs	35	125	1.00	1.00	
Place of delivery	Home	76	77	2.83 (1.84.4.36)*	2.40 (1.38,4.18)**	0.002
	Health facility	60	172	1.00	1.00	
Duration of labor	≤2 days	73	195	1.00	1.00	
	>2 days	63	54	3.12 (1.98,4.90)*	3.22 (1.75, 5.91)**	0.000
Width of fistula	≤3 cms	73	202	1.00	1.00	
	>3 cms	63	47	3.71 (2.34,5.89)*	2.30 (1.27,4.17)**	0.006
Fistula classification	Grade 1	9	58	1.00	1.00	
	Grade 2	18	105	1.11 (0.48,2.62)	1.19 (0.46,3.08)	0.724
	Grade 3	35	55	4.10 (1.81,9.31)*	3.26 (1.29,8.27)**	0.013
	Grade4	74	31	15.38 (6.79,34.85)*	9.76 (3.71,25.67)**	0.000
Statues of Vaginal scar	No scar	4	14	1.00	1.00	
	Mild scarring	59	176	1.17 (0.37,3.70	0.43 (0.12,1.62)	0.214
	Moderate scar	41	46	3.12 (0.95,10.24)	0.71 (0.17,2.93)	0.638
	Sever scar	32	13	8.62 (2.38,31.13)*	0.64 (0.13,3.10)	0.580
Status of bladder neck	Intact	40	177	1.00	1.00	
	Partial damage	61	59	4.58 (2.79,7.51)*	1.64 (0.860,3.12)	0.134
	Complete destruction	35	13	11.91 (5.78,24.55)*	2.70 (1.07,6.66)**	0.036
Post operation infection	Yes	44	39	2.58 (1.57,4.23)*	2.98 (1.56,5.70)**	0.001
	No	92	210	1.00	1.00	

*statistically associated with p<0.2, **statistically associated with p<0.05.
COR-crude ODDS ratio, AOR-adjusted ODDS ratio.

DISCUSSION

This study estimated the magnitude of OF repairing failure and its determining factors; by referring the five years follow up cards women who underwent fistula recovering at Bahir Dar Hamlin fistula center. The study revealed that the magnitude of OF repairing failure was 35.3% (P=35.3%, 95%CI: 30.9, 40.1). This finding was higher than other studies conducted in different study areas like: Democratic Republic of the Congo (24%), Guinea (14.5%), Zambia (27.1%), Yirgalem of Ethiopia (18.3%).[2,13,20,21] The reason for the higher rate of repair failure might be because of the differences in diagnostic accuracy, evaluation and timely repair using procedures that exploit basic surgical principles and the application of interposition flaps.[22,23]

Weight of women during repairing was the factor for OF repair failure. Women who were less than 50 kg at repairing were 3.43 times more likely for OF repairing failure than their counterparts. This finding was in agreement with previous studies conducted in Ethiopia.[21]

Duration of labour was an important factor for OF repaired repairs. It showed that women who labored for more than 2 days during the current delivery were almost 3.22 times more likely to fail than those who labored for at most 2 days. This finding was comparable with previous studies conducted in Kenya, Uganda and Rwanda.[24-26]

Home delivery was also another predictor for OF repair failure in this study area. Women who gave birth at home were almost 2.40 times more likely to experience failure after OF repairing than women who gave birth at health institutions; this was supported by another clinical study conducted in Zambia.[13,21]

In this study, fistula classification (grades of fistula) was statistically associated factor for OF repairing failure. Women who developed grade three and grade four OF were 3.26 and 9.76 times more likely prone to failure of OF repairing than grade one fistula. The finding was supported by the study done in Kenya.[27]

Width of fistula and status of bladder neck were other determinant factors of OF repair failure. Women who had a width of fistula greater than 3cm and completely destructed bladder neck were more likely to experience OF repair failure compared to their counterparts. This finding was also supported by other studies in different areas.[20,21,28]

Among fistula repairing women who developed postoperative infection were almost 3 times more likely to experience fistula repairing failure than their counterparts. This finding was in agreement with previous studies. It said that failure of OF repair was associated with wound infection. This is the fact that the presence of infection at repairing site affected would heal.[29] The reason might be linked to the quality of services including quality of surgery, implementation of infection prevention measures or postoperative care. It is known that poor care of surgery or post operation care exposed to bacterial infection and the presence of infection, prolonged or affected healing of wounds or closure of the repaired fistula.

CONCLUSION

The magnitude of fistula repair failure determined in this study was relatively higher compared to other studies. Women's weight less than 50 kg at repairing time, home delivery, more than two days duration of labour, greater than 3cm width of fistula, grade 3 and grade 4 fistula classes, complete destruction of the bladder neck and post-operative infection were statistically associated factors with OF repair failure. Dietary supplement before and during pregnancy should be promoted to improve the weight of mothers. Wider as well as grade 3 and grade 4 fistula might be associated with early marriage (94% of our study participants had married at less than 20 years of age) Institutional delivery should also be promoted; this intern will reduce the duration of labour and damage of the bladder neck. The fistula repairing center has to assure aseptic post-operative care.

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