Journal of Pregnancy and Child Health
ISSN: 2376-127X

Komba et al., J Preg Child Health 2022, 9:11

Research Article Open Access

Predictors of Poor Outcome after Obstetric Vesico-Vaginal Fistula Repair at Comprehensive Community Based Rehabilitation and Disability Hospital in Tanzania: A Retrospective Review of Records

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Abstract

Background: Obstetric fistula is a common and serious maternal morbidity in developing countries. Treatment of the condition involves repair of the fistula. This study aims at determining predictors of poor outcome after obstetric Vesico-Vagina Fistula (VVF) repair at Comprehensive Community Based Rehabilitation and Disability Hospital in Tanzania (CCBRT DH).

Methods: Case notes of all women who underwent obstetric VVF repair from 1st January 2015 to 31st December 2016 were reviewed. Patient's files, fistula card as well as operating book register were used to retrieve the data. Information extracted were age at current fistula occurrence, parity, marital status, site of the fistula, number of prior repair attempts, route of repair, status of vaginal, residual bladder size and urethral involvement. Poor outcome was defined as failure of fistula closure evaluated by dye test; or presence of urinary incontinence at hospital discharge. Bivariate and multivariate analyses were done for predictors of poor outcome using SPSS version 20.0.

Results: Out of 702 women, 119 (17%) women had poor outcome. Forty two (6%) women had failure of fistula closure, whereas 77 (11%) women had urinary incontinence.

Predictors of poor outcome were presence of moderate and severe vaginal scarring (Odds Ratio (OR)=1.9; 95% Confidence Interval (CI)= 1.0, 3.5; p=0.04) and (OR=2.5; 95% CI=1.3, 4.6; p<0.01) respectively; involvement of urethra (OR=3.8; 95% CI=2.3, 6.3; p<0.01); small residual bladder size (OR=2.3; 95% CI=1.3, 4.1; p<0.01); juxtaurethral fistula (OR=2.6; 95% CI= 1.2, 5.4; p=0.01) and having two or more previous repair attempt (OR= 8.4; 95% CI= 1.3, 19.8; p<0.01).

Conclusion: Features of severe urethra and bladder injury, presence of vaginal scarring, fistula close to the urethra as well as number of prior repair attempts; have been shown to predict poor outcome after repair. Case selection according to the experience of the surgeon is vital, considering most scarred fistula and those with destruction of continence mechanism predict poor outcome after repair.

Keywords: Obstetric Fistula; Predictors; Poor outcome of repair.

Introduction

Background

Obstetric fistula is a debilitating birth injury that affects 2-4 million women globally, mostly in Sub-Saharan Africa and Asia. In Tanzania, it is estimated that between 1,200 and 3,000 new cases of obstetric fistula occur each year. The urinary and/or fecal incontinence associated with fistula affects women physically, psychologically and socioeconomically.

Fistula closure rate ranges from 65-95%. The WHO recommends a closure rate of 85% of which 90% should be without incontinence. When reviewing records of all fistula repaired 2014 in Tanzania, Siddle and colleagues reported a fistula closure rate of 91% of which 39% had urinary incontinence. This shows there is significant poor outcome among cases repaired in Tanzania. Poor repair outcome after obstetric Vesico-Vagina Fistula (VVF) repair is a failure of fistula closure (positive dye test); or presence of urinary incontinence (negative dye test) at hospital discharge. This brings frustration to both surgeon and patient, causing further isolation and depression to the patient [1].

Studies have shown younger age and lower parity to be significantly associated with development of poor outcome after repair. Maturity of the pelvis and supporting soft tissues account for complete continence since immature pelvis is linked with obstructed labor. Furthermore, longer duration of fistula as well as more days in labor have been shown to associate with development of poor outcome after repair. Severe vaginal scarring reduces the amount of viable tissues leading to failure of fistula to close and presence of poor outcome following repair. A systematic review of literature examining predictors of fistula repair outcomes has shown that vaginal scarring and urethral involvement are associated with poor prognosis. Moreover, stronger evidence has been shown to support negative influence of small residual bladder

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Received: 23-Oct-2022, Manuscript No: jpch-22-78093, **Editor assigned:** 24-Oct-2022, PreQC No: jpch-22-78093(PQ), **Reviewed:** 7-Nov-2022, QC No: jpch-22-78093, **Revised:** 14-Nov-2022, Manuscript No: jpch-22-78093(R), **Published:** 21-Nov-2022, DOI: 10.4172/2376-127X.1000563

Citation: Komba BE, Said A, Chapa J (2022) Predictors of Poor Outcome after Obstetric Vesico-Vaginal Fistula Repair at Comprehensive Community Based Rehabilitation and Disability Hospital in Tanzania: A Retrospective Review of Records. J Preg Child Health 9: 563.

size, Waaldijk classification type, site of the fistula as well as prior repair attempts; on repair outcomes.

To our knowledge, little is known regarding predictors of poor outcome following obstetric VVF repair in Tanzania. This study aims at determining predictors of poor outcome of obstetric VVF repair at Comprehensive Community Based Rehabilitation and Disability Hospital in Tanzania (CCBRT DH) [2].

Methods

Study design and population

A cross sectional analytical study design was adopted. All women who underwent obstetric VVF repair at CCBRT DH from January 1st 2015 to December 31st 2016 were included. Patient whom had Recto-Vaginal Fistula (RVF) or both VVF and RVF were excluded from the study because factors that predict poor outcome among VVF (such as involvement of urethra, presence of vaginal scarring and small residual bladder size) are different from those that predict poor outcome among RVF (such as Crohn's disease, smoking and infection).

Study setting

Comprehensive Community Based Rehabilitation and Disability Hospital is a non-governmental organization in Dar es Salaam, Tanzania. Fistula ward at the hospital was opened in 2004, and from then to 2015, over 3000 women have undergone surgical repair. The ward has 72 beds and approximately 45 fistula surgeries are done on a routine basis in a month. The ward is managed by a team of doctors which include 2 fistula surgeons and registrars, who work together on routine activities [3].

Data collection and procedures

Data was collected using a compilation sheet which contained information including patient's particulars- current fistula occurrence (years), age at current fistula closure (years), parity, current number of living children, mode of delivery (vaginal or caesarean section) and duration of labour (in days); fistula related characteristics- route of repair (abdominal versus vaginal), who operated the patient (trainee under supervision, experienced surgeon), Waaldijk classification type (I, IIA, IIBa and IIBb), state of vaginal scarring and urethral involvement. Treatment outcome included the results of dye test prior to the discharge of the patient and were summarized as; fistula closed (yes or no) and fistula continent (yes or no).

Records of all women who underwent VVF repair were obtained in the theatre record book. Their files were traced in the medical records and those whose women underwent obstetric VVF repair were included in the study [4].

Data analysis

The collected data were coded, entered, cleaned and analyzed using the Statistical Package for the Social Science (SPSS) version 20.0. Independent variables were patient's particulars and fistula related characteristics shown above. Dependent variables were poor and good outcomes. Frequencies of socio- demographic characteristics were obtained and tabulated. Bivariate analysis was done, cross tabulating independent variables to dependent variables. Means and standard deviation were used in a normally distributed variables; median with interquartile ranges were used for abnormally distributed variables. A valid percentage was used in reporting. Poor outcome was obtained by transforming and recording as "0" for variables fistula failure to close and urinary incontinence. Chi square test was used to test availability of the association between categorical variables. P-value of less than 0.05 was considered as significant. Independent variables with p-values of less than 0.2 in the bivariate analysis were entered into multivariate analysis. A small bladder meant a bladder size less than 6 cm. Moreover, a severe vaginal scarring was reflected by the need of vaginoplasty or large episiotomy to enable the introduction of an Auvards speculum while moderate vaginal scarring was used when there was visible scarring without need for vaginoplasty or episiotomy. Urethra was said to be involved if the distance between the external urinary meatus and distal margin of the fistula was < 3.5 cm and previous surgical repair denoted either having a previous successful surgery and sustained another obstetric fistula after a subsequent delivery or having had a previous failed repair. Experienced fistula surgeon was the one who has performed at least 300 repairs, with on-going case load of more than 150 repairs per year [5].

Results

During the study period, a total of 764 women underwent obstetric VVF repair. Of these, files of 62 women were missing thus 702 (91.9%) women were available for analysis.

Majority of women report to deliver at health facility 617 (88.3%); and 427 (61.1%) had cesarean section mainly due to prolonged labor. However, a high rate of stillbirth is noted 544 (77.6%).

Overall fistula closure was achieved among 660 (94%) women. One hundred and nineteen women (17.0%) had poor repair outcome. The proportion of women who had failed obstetric VVF repair was 6.0% whereas the proportion of those who had residual urinary incontinence was 11.0%.

In a bivariate analysis, an association was found among prime paras at fistula occurrence (OR=2.1, 95% CI=1.1-4.0: p=0.03); delivery through vaginal route (OR=1.6, 95% CI=1.1-2.3: p=0.01) and having labor for more than 24 hours (OR=1.7, 95% CI=1.1-2.6: p=0.01); to poor repair outcome. Moreover, women having moderate and severe vaginal scarring (OR=2.7, 95% CI=1.6-4.6: p<0.01) and (OR=3.8, 95% CI=2.2-6.4: p<0.01) respectively; urethral involvement (OR=4.2, 95% CI=2.7-6.6: p<0.01); small residual bladder size (OR=2.3; 95% CI=1.4, 3.8; p<0.01); juxtacervical and juxtaurethral fistula (OR=2.2, 95% CI=1.1-4.4: p<0.01) and (OR=3.9, 95% CI=2.1-7.4: p<0.01) respectively; Waaldijk classification type IIA, IIBa and IIBb (OR=1.8, 95% CI=1.1-3.1: p<0.01), (OR=3.5, 95% CI=1.8-6.4: p<0.01) and (OR=5.8, 95% CI=3.2-10.5: p<0.01) respectively and prior 2 or more repair attempts (OR=8.1, 95% CI=3.8-17.7: p<0.01); had an association to poor repair outcome [6].

After adjusting for marital status, parity, mode of delivery, duration of labor, vaginal scarring, urethral involvement, residual bladder size, site of the fistula, Waaldijk classification type and number of previous surgical repair attempts; only moderate and severe vaginal scarring (adjusted Odds Ratio (aOR)=1.9, 95% CI=1.0-3.5: p=0.04) and (aOR=2.5, 95% CI=1.3-4.6: p<0.01) respectively; involvement of the urethra (aOR=3.8, 95% CI=2.3-6.3: p<0.01); small residual bladder size (aOR=2.3, 95% CI=1.3-4.1: p<0.01); juxtaurethral fistula (aOR=2.5, 95% CI=1.2-5.3: p=0.01) and prior 2 or more repair attempts (aOR=8.4, 95% CI=3.6-19.8: p<0.01); independently predicted poor repair outcome.

Discussion

This study provides an overview on the factors associated with poor

repair outcome among women who underwent obstetric VVF repair at CCBRT DH in Tanzania. The findings from this study shows that status of the vagina and urethra, size of residual bladder, site of the fistula and prior repair attempts are independent predictors to poor repair outcome.

The proportion of failed fistula closure and residual urinary incontinence obtained in this study was smaller compared to the previous retrospective review of record conducted at CCBRT DH in 2014. This could be due to the fact that, the previous study reported the outcome of all types of fistula (VVF, RVF, ureteric) rather than obstetric VVF alone. Several other studies have shown a lower proportion of failed obstetric VVF closure and residual urinary incontinence than the one obtained in this study. This could be explained in part by the differences in the study design, competencies of the surgeons as well as choices of the cases [7].

A delay in accessing emergency obstetric care has been shown in our study, with most of women noted to have experienced prolonged obstructed labor. Most of these deliveries resulted into still birth. Similarly, in Zambia, a high rate of still birth has been noted with delay in transportation being noted as one among the reasons.

In this study, vaginal scarring independently predicted poor repair outcome. It is expected that, a scarred fistula maybe difficult to mobilize and this lead to inability of a tension free repair. A study done in Sierra Leone showed similar findings; presence of vaginal scarring independently predicted failed closure after repair. However, in one among the most recent study done to determine predictors for failure of obstetric fistula repair; vaginal scarring is not an independent predictor to failure to close or urinary incontinence after repair. This study was conducted in 3 hospitals supported by Engender Health in Guinea. Since there is no accepted standard among fistula surgeons for measures such as degree of scarring, the classification of participants suspected to have vaginal scarring may be subjected to bias from one setting to the other.

In our study, urethral involvement has been noted to be independently associated with poor repair outcome. This result was expected considering anatomical and physiological functions of urethra to continence. It is possible that involvement of urethra impairs it of its physiological function leading to urinary incontinence. Several studies suggests that urethral involvement maybe significantly associated with urinary incontinence; and failed repair outcome [8].

Another independent predictor to poor outcome is presence of small residual bladder size. Stiffness and fibrosis after bladder repair may cause the bladder to lose its ability to be a compliant organ and not act as a reservoir of urine. Small residual bladder size independently predicted failure of fistula closure; and urinary incontinence post repair. Several of the published studies are noted not to have analyzed size of the residual bladder. This probably may be due to absence of documentation of the bladder size intra operatively. The contribution of small bladder size to poor repair outcomes should be emphasized, and hence, improvement of its documentation in different settings.

Furthermore, presence of juxtaurethral fistula independently predicted poor repair outcome. A fistula close to the external urinary meatus may probably cause destruction of urine continence mechanism as a result lead into residual urinary incontinence post repair. In Ethiopia, Democratic republic of Congo and Liberia, similar findings have been shown; with juxtaurethral fistula independently predicting urinary incontinence. Another study showed "lower" fistulas (urethral-vaginal, juxtaurethral, fistula behind symphysis pubis) and "larger" fistula (entire anterior vaginal wall destroyed); independently predicted urinary incontinence after repair. In a certain study, however, no significant association between fistula location and repair outcomes was found. This finding possibly resulted from small number of failed repairs.

In this study, having 2 or more prior repairs independently predicted poor outcome. Prior repairs are the risk to stress incontinence probably because after every repair a scar is left behind around the urethra thus removing physiological function. Similar finding has been shown in a retrospective review of records done in Rwanda. In Ethiopia, however, no significant association was found between women who had a repeated repair with urinary incontinence post repair. A small sample size could contribute to this finding. Care should be emphasized at first time repair since subsequent repairs predict poor outcome [9].

The strength of this study is based on the large sample size as compared to available reported studies. Also, considering the fact that 87% of all these repairs were conducted by specialized fistula surgeons. This provides strength on the level of expertise used, and the results that have been obtained. The findings of this study provide baseline information on obstetric fistula repairs in Tanzania. It has also pointed out the experience of obstetric VVF repair at CCBRT DH and several challenges encountered. These findings offer another area of research especially on treatment modalities of urinary incontinence post fistula repairs.

Since this was a retrospective study, the limitations of this study based on the difficulties on retrieving information in the available clinical notes. This included missing or unsound data from the files, fistula cards and operation notes. Bearing in mind the nature of this study, a causal association could not be established. A logistic regression conducted has helped explaining by how much the variation in the outcome can be explained by the change in the predictors obtained. Moreover, a combined outcome of poor outcome (failed fistula closure and presence of urinary incontinence), limit this study since it give challenge in interpreting the results. A prospective study as opposed to retrospective study is recommended in the future. This will help in reducing information bias [10].

Conclusion

Severe urethra and bladder injury, presence of vaginal scarring, fistula close to the urethra as well as number of prior repair attempts predicted poor outcome after repair. Case selection according to the experience of the surgeon is vital, considering most scarred and those with destruction of continence mechanism predicted poor outcome after repair.

List of Abbreviations

CCBRT in Tanzania	Comprehensive Community Based Rehabilitation
C/S	Cesarean Section
DH	Disability Hospital
MUHAS	Muhimbili University of Health and Allied Sciences
RVF	Recto-Vaginal Fistula
SPSS	Statistical Package for the Social Sciences
VVF	Vesico-Vaginal Fistula
WHO	World Health Organization

Declarations

Ethics Approval

The ethical clearance was obtained from Senate Research and Publication Committee of Muhimbili University of Health and Allied Sciences (MUHAS), with reference number MU/PGS/SAEC/Vol. IX. Permission to conduct the study was obtained from Director of CCBRT Disability Hospital, Dar es Salaam.

Consent for Publication

Not applicable

Availability of Data and Materials

The dataset generated and analyzed during the current study is submitted with this manuscript as an additional file.

Competing Interests

The authors declare that they have no competing interests

Funding

This research was funded by Muhimbili National Hospital.

Author's Contribution

BEK, AS, and JC participated on study design, proposal development, data collection and analysis. BEK drafted the manuscript. AS and JC read and approved the final manuscript.

Acknowledgement

Special thanks to Muhimbili National Hospital for financial support; and CCBRT DH for permission to conduct this study. I would like to acknowledge all members of MUHAS for their valuable contribution during development of this work. This study is part of the Dissertation for Master of Medicine in Obstetrics and Gynaecology of the Muhimbili University of Health and Allied Sciences.

Author's Information

Not applicable

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