

Non-Fistulous Complications of Prolonged Obstructed Labour among Obstetric Fistula Patients in Southern Nigeria

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Abstract

Background: Long-term complications of prolonged obstructed labour are multisystemic, obstetric fistula about the most devastating. Efforts at controlling obstetric fistula pay little attention to the non-fistulous injuries which reduce the quality of life of the affected women even after a successful fistula repair. The objectives of this study were to determine the burden of the non-fistulous complications among fistula patients, identify these injuries and the factors associated with them. **Methods:** This cross-sectional study was conducted at the National Obstetric Fistula Centre, Abakaliki, South-East Nigeria from July to December 2016. The hospital has performed over 2600 free fistula repairs. This study was approved by the Research and Ethics Committee of the hospital. The study population comprised of women who developed obstetric fistula following prolonged obstructed labour. Direct questioning, examination findings, operation findings and laboratory results, using a pre-tested, semi-structured and interviewer-administered proforma were used to collect data. Informed consent was obtained from the subjects. Data were analyzed using the Statistical Package for Social Sciences [SPSS] version 21. Frequency and proportions were used to describe categorical variables while means and standard deviation were used to describe continuous variables. Association between categorical variables and direct obstructed labour injuries was tested using chi-square test and predictors of obstructed labour injuries were determined using logistic regression. A P-value < 0.05 was considered statistically significant. **Results:** One hundred and sixty one (161) women participated in the study. The mean age of the women was 33.4 years while the mean parity was 3.2. Non-fistulous complications of prolonged obstructed labour were found in 96.9% (156) of the women. These in-

cluded cervical retraction (42.2%), obstetric nerve palsy (30.4%), vaginal scarring (29.8%), partial urethral loss (16.1%), anal sphincter injury (3.1%), cervical stenosis (5.0%) and urethral stenosis (3.7%). Others were ammoniacal dermatitis (29.2%), secondary amenorrhoea (21.7%), secondary infertility (9.3%), dyspareunia (6.8%), hypomenorrhoea (1.2%) and bladder stone (3.7%). Majority (79.4%) of the women with cervical retraction had caesarean section (CS) as against 20.6% who had vaginal delivery. This was statistically significant ($P < 0.001$). A higher proportion of participants with amenorrhoea were delivered via CS (44.3%) compared to those who had vaginal delivery (21.2%). This was also statistically significant ($P = 0.012$). Neurologic injury was associated with primiparity although this was not statistically significant ($P = 0.171$). **Conclusion:** Almost all fistula patients also have non-fistulous complications of prolonged obstructed labour. Efforts to manage the fistula should equally address these complications. We advocate comprehensive care for identification and management of these injuries to improve the quality of life and overall well-being of these women. To reduce complications like cervical retraction, there should be an emphasis on safer caesarean section for women with prolonged obstructed labour.

Keywords

Non-Fistulous Complications, Obstructed Labour, Obstructed Labour Injuries, Obstetric Fistula

1. Introduction

Childbirth may be complicated by mechanical obstruction to fetal passage leading to devastating maternal and perinatal outcomes. Obstructed labour is one of the commonest preventable causes of maternal and perinatal morbidity and mortality both globally and in the developing world [1] [2]. It is a mechanical halt in the progress of labour despite adequate uterine contractions requiring an operative intervention [3]. Prolonged obstructed labour occurs when obstructed labour is unrelieved either because it is not recognized or intervention is not immediately available. Compression of the soft tissues between the fetal head and the bony pelvis causes ischaemic necrosis which is followed in a few days by the formation of a fistula. The duration of soft tissue impaction determines the degree of tissue necrosis and the short and long-term injuries observed [4].

Obstetric fistula continues to be a scourge in low- and middle-income countries [5]. Prolonged obstructed labour is the commonest cause [6] [7] [8]. Beside fistula, there are other short- and long-term complications of prolonged obstructed labour constituting major reproductive health problems [9] [10] [11]. These injuries are multifaceted and usually involve many systems [12]. The syndrome of obstructed labour injuries first described by Arrowsmith and colleagues affects urological, gynaecological, gastrointestinal, dermatological, musculoskeletal, or neurological systems [12]. It may also involve fetal and a spec-

trum of psychosocial injuries. Hence, obstructed labour is regarded as the most disabling of all maternal conditions [4].

While the emphasis has been on short-term morbidities and obstetric fistula associated with prolonged obstructed labour, non-fistulous complications are often ignored. This has led to inadequate long-term care and reduced quality of life of women with complications of obstructed labour. The objectives of this study were to determine the proportion of obstetric fistula patients living with non-fistula complications of prolonged obstructed labour, identify the different injuries, their prevalences and the factors associated with them.

2. Methods

This cross-sectional study was conducted at the National Obstetric Fistula Centre (NOFIC), Abakaliki, Nigeria from July to December 2016. The Centre is one of the three National Fistula Centres in Nigeria. It is a national reference centre for research, training, free treatment, prevention and rehabilitation of women with obstetric fistula. The hospital has performed over 2600 free fistula surgeries since inception. Ethical approval was obtained from the Health Research and Ethics Committee of the hospital.

The study population comprised women who presented with obstetric fistula following prolonged obstructed labour. Women with obstetric fistula were excluded if they have had a previous repair or if the fistula complicated an assisted vaginal delivery. Direct questioning, findings from general/systemic examinations, operation findings and laboratory results, using a pre-tested, semi-structured and interviewer-administered proforma designed for this study were employed to collect data. Informed consent was obtained from prospective participants prior to administration of the proforma.

The proforma was administered in sections: in the out-patient clinic and pre-operative ward (for biodata, relevant obstetric history and identified complications), then in theatre (for characterizing the fistula and other identified complications of prolonged obstructed labour). To overcome language barrier in the sections that required relevant history taking, the proforma was administered with the assistance of trained translators who could communicate fluently in Igbo, the predominant language in the geopolitical region. Height and weight were measured with standardized protocols. A stadiometer was used to measure height to the nearest 0.5 cm and weight was measured using calibrated scales to the nearest 0.1 kg. Body mass index (BMI) was then calculated and classified according to World Health Organisation classification.

In this study, a subset of all identified non-fistula injuries, termed “direct obstructed labour injuries or direct obstetric injuries” was used for the purpose of bivariate analysis, using the chi-square test. Direct obstructed labour injuries were defined as any injuries occurring as a direct consequence of pressure necrosis or ischaemic injury from prolonged obstructed labour or its management (such as complete or partial urethral loss, vaginal scarring, vaginal stenosis, cer-

vical defect, cervical retraction, anal sphincter damage, osteitis pubis and foot drop).

Data were analyzed using the Statistical Package for Social Sciences [SPSS] version 21. Frequency and proportions were used to describe categorical variables while means and standard deviation were used to summarize continuous variables. Association between categorical variables and direct obstructed labour injuries was investigated using chi-square test and predictors of obstructed labour injuries were determined using logistic regression. A P-value < 0.05 was considered statistically significant.

3. Results

One hundred and sixty one (161) women were studied. The mean age of the women was 33.4 years. Almost half (42.2%) were between the ages of 30 - 39 years. More than half (68.3%) of the participants were married and their predominant (34.8%) occupation, and that of their husbands (26.1%) was farming. About a quarter (24.2%) of participants had no formal education while some (37.3%) participants had only primary education (**Table 1**).

The mean parity among the study population was 3.2 (SD = 2.3, median = 2, with a range of 1 - 10 deliveries). More than one third (39.1%) of the women did not have any living child. Mode of delivery was mainly (62.7%) via caesarean section (**Table 2**). The mean height of the women was 1.5 m (SD = 0.1) and ranged between 1.2 - 1.81 while mean weight was 58.0 kg (SD = 15.4) and ranged between 34.0 - 102.0 kg. More than half of the women were > 1.5 m (57.1%). Most (90%) participants had packed cell volume of $\geq 30\%$.

Non-fistulous complications of prolonged obstructed labour were found in 96.9% (156) of the women. These included cervical retraction (42.2%), obstetric nerve palsy (30.4%), vaginal scarring (29.8%), partial urethral loss (16.1%), anal sphincter injury (3.1%), cervical stenosis (5.0%) and urethral stenosis (3.7%). Others were ammoniacal dermatitis (29.2%), secondary amenorrhoea (21.7%), secondary infertility (9.3%), dyspareunia (6.8%), cervical stenosis (5.0%), urethral stenosis (3.7%), bladder stone (3.7%), anal sphincteric injury (3.1%) and hypomenorrhoea (1.2%) (**Table 3**). Also, most of the participants had stillbirths (90.0%) and social restrictions (75.8%).

One hundred women had CS while 60 had vaginal delivery. Majority (79.4%) of the women with cervical retraction had CS as against 20.6% who had vaginal delivery. This was statistically significant ($P < 0.001$) (**Table 4**). A higher proportion of participants with amenorrhoea were delivered via CS (44.3%) compared to those who delivered via SVD (21.2%). This was also statistically significant at $P = 0.012$ (**Table 5**).

In addition to the association of caesarean section with cervical retraction and amenorrhoea, neurological injuries seen in 30.4% of participants occurred more among primiparas (40%) compared with grand multiparas (29.5%) and multiparas (23.9%), although this was not statistically significant ($P = 0.171$).

Table 1. Baseline socio-demographic characteristics of participants.

Variable	Frequency	Percentage
Age (years)		
Mean (SD)	33.4 (10.0)	15 - 68
<20	6	3.7
20 - 29	51	31.7
30 - 39	68	42.2
40 - 49	23	14.3
50 - 59	7	4.3
60+	6	3.7
Occupation		
Farming	56	34.8
Artisan	27	16.8
Trading	43	26.7
Teaching	6	3.7
Unemployed	15	9.3
Civil servant	2	1.2
Student	2	1.2
Others	10	6.2
Marital status		
Single	20	12.4
Married	110	68.3
Divorced	30	1.9
Separated	13	8.1
Widowed	15	9.3
Educational level		
No formal education	39	24.2
Primary	60	37.3
Secondary	45	28.0
Tertiary	17	10.6

4. Discussion

For every woman who dies of pregnancy-related causes, at least 20 others experience injuries of varying severities [13]. Prolonged obstructed labour is estimated to be a major contributor to these injuries of which obstetric fistula is the most prominent. This study was done to highlight the other harrowing complications of prolonged obstructed labour.

Table 2. Obstetric history of participants.

Variable	Frequency	Percentage
Parity		
Mean (SD)	3.2 (2.3)	1-10
Primipara	50	31.1
Multipara	67	41.6
Grandmultipara	44	27.3
Number of children alive		
None	63	39.1
1	38	23.6
2+	60	37.3
Place of delivery		
Home	8	5.0
PHC	1	0.6
Secondary health care facility	20	12.4
Tertiary health care facility	27	16.8
Private maternity	93	57.8
TBA	9	5.6
Religious centre	3	1.9
Antenatal care (ANC)		
Yes	128	79.5
No	33	20.5
Number of ANC visits		
Mean (SD)	6.73 (3.6)	0 - 21
<4	25	15.5
≥4	109	67.7
Mode of delivery		
SVD	60	37.3
CS	101	62.7
Duration of labour (hours)		
Mean (SD)	43.2 (24.2)	10 - 120
<18	10	6.2
18 - 24	48	29.8
>24	103	64.0

The mean age of the women was 33.4 years and most (73.9%) were aged 20 to 39 years. This finding is similar to a previous report from South-East Nigeria [14] and differs from reports from Northern Nigeria which reported obstetric fistula mainly among teenagers (26.5%, 51.52%, 72.5%) [15] [16] [17]. Many

Table 3. Non-fistulous (direct) complications of prolonged obstruction labour.

Non-fistula complications	Percentage (%)
Cervical retraction	42.2
Obstetric nerve palsy	30.4
Vaginal scarring	29.8
Ammoniacal dermatitis	29.2
Secondary amenorrhoea	21.7
Partial urethral loss	16.1
Secondary infertility	9.3
Dyspareunia	6.8
Cervical stenosis	5.0
Urethral stenosis	3.7
Bladder stone	3.7
Anal sphincter injury	3.1
Hypomenorrhoea	1.2

*Many women had multiple responses.

Table 4. Association between mode of delivery and cervical retraction.

		Cervical Retraction		Total	P-value
		YES (%)	NO		
Mode of delivery	CS	54 (79.4)	46 (50.0)	100	<0.001
	SVD	14 (20.6)	46 (50.0)	60	
Total		68 (100)	92 (100)	160	

Table 5. Association between amenorrhea and mode of delivery.

Variable	Amenorrhea		Total	P-value
	Yes (%)	No (%)		
Mode of delivery				
CS	31 (44.3)	39 (55.7)	70 (100)	0.012
SVD	7 (21.2)	26 (78.8)	33 (100)	

(61.5%) women had no formal or primary education. In studies conducted in Northern Nigeria, 81% [18] and 95% [15] of participants did not have any formal education. This has strong implications for early marriage, poverty, lack of empowerment and poor health-seeking behaviour.

The mean parity of the women was 3.2 (± 2.3). Despite the association of primiparity with women with obstetric fistula following prolonged obstructed labour [9] [19], most of the participants in this study were multiparous (41.6%) and a further 27.3% were grandmultipara. This is similar to previous report from South-East Nigeria in which multiparous and grandmultiparous women were

40% and 26.7% respectively [14]. On the contrary, women with fistula were mainly primipara in South-West (43.6%) [20], North Central—(50%) [17], North-West—(69.8%) [16] Nigeria.

The mean height of the women was 1.5 m and more than half (57.1%) of them were > 1.5 m tall. A woman is considered to be at risk obstetric complications if her height is below 145 cm [21]. Most of the women studied were not short-statured. This is because early marriage is not important in the causation of fistula in the south compared to the northern Nigeria.

About 70% of the participants were married. Although this finding is similar to previous reports from southern parts of Nigeria and Zambia [14] [20] [22]. This is contrary to findings of high rates of separation and divorce noted amongst women with obstetric fistula [18] [23] [24]. The significant proportion of women with obstetric fistula who were married in this study may be due to differences in acceptability of divorce in Southern Nigeria compared to Northern Nigeria, which is reported to have one of the highest rates of divorce in West Africa [25].

Similar to reports from other studies [18] [23] [25], almost all deliveries in this study resulted in stillbirth 145 (90%) and early neonatal death 4 (2.5%). More than one third (39.1%) of the women did not have any living children. The implications of this include social stigma, loss of self-esteem, increased likelihood of divorce and reduced ability to cope psychologically with the fistula.

A total of 156 (96.9%) participants had non-fistula complications of prolonged obstructed labour. Cervical retraction was the commonest gynaecological complication (42.2%). That is, on vaginal examination, the vaginal part of the cervix was not visualized with no definable vaginal fornices. The prevalence of this complication has not been previously reported as this is the first report of cervical retraction as a non-fistulous complication of prolonged obstructed labour in Nigeria. It is caused either by extensive cervical tissue loss from ischaemic necrosis or as a consequence of placing an incision too low on an overstretched cervix at caesarean delivery following prolonged obstructed labour. Healing with significant fibrosis may fix the cervix higher up in the pelvis. Cervical retraction was seen both in women who had spontaneous vaginal delivery and those who had caesarean section. However, it was significantly associated with caesarean delivery ($P < 0.001$). The implication of this is enormous. It poses technical challenges during the repair of high intra-cervical fistulas. In women are already at risk of secondary infertility and amenorrhoea, the inability to identify the cervix, external os or access the uterine cavity poses challenges with procedures like hysterosalpingography, hysteroscopy, cervical dilatation, intrauterine adhesiolysis, intrauterine insemination, embryo transfer and Papanicolaou smear. Furthermore, cervical retraction could cause overstretching of the pubocervical fascia and could theoretically increase the risk of urinary incontinence or prolapse in future.

The prevalences of vaginal scarring and vaginal stenosis were 29.8% and 24.8% respectively. Gynaetresia was seen in 9.97% women with urinary fistulae

in Sokoto, Nigeria [16]. Vaginal scarring and stenosis are poor prognostic factors for successful repair with risks of postoperative stress incontinence and recurrence [9]. It could also cause dyspareunia. In a publication on sexual activity among Nigerian women following successful fistula repair, 22.5% reported inability to have penetrative vaginal intercourse with 52% of them ascribing it to a “tight” or “narrow” vagina [26].

Amongst women presenting at six months or longer following development of fistula, the prevalence of secondary amenorrhea was 23.6%. A statistically significant association between amenorrhea and caesarean delivery was found ($P = 0.012$). Women who eventually had vaginal delivery following prolonged obstructed labour were more likely to resume menstruation within six months compared to those delivered by caesarean section. This may explain the relatively lower report of secondary amenorrhea in Northern Nigeria (4.5%, 17.5%) [15] [16] compared to the South (23.6%, 51%) [20]. Arrowsmith *et al.* reported prevalence of amenorrhea up to 63.1% in Ethiopia [12]. The possible mechanisms are intrauterine adhesions from puerperal sepsis; hypothalamic or pituitary dysfunction from haemorrhage or psychological impact of their condition [12].

Amongst women who presented after one year and had been trying to conceive, the prevalence of secondary infertility was 9.3%. In a Malawian study, complaints of infertility were more frequent and urgent among women who had undergone repair than those who had not [27]. A high premium is placed on children in Africa as this is needed to secure a woman’s marriage. She is more likely to be supported in spite of her injury if she has a living child. An approach to fistula management that incorporates restoration of fertility would be more satisfying for these women.

Urological complications found in this study included urinary tract infection, circumferential defect at the bladder neck, urethral loss and bladder stones (61.5%, 21.7%, 16.8% and 3.7%, respectively). Urinary tract infection was seen in 61.5% of participants. The proportion of women with UTI is much higher than 26.2% reported in Sokoto [16], but similar to findings of 52.8% and 58.1% in Ethiopia [28] [29]. Circumferential defect, urethral involvement and extensive vaginal scarring predict poor prognosis of surgical outcomes of obstetric fistula repair [30] [31].

Dermatological injuries included ammoniacal dermatitis (29.2%), pruritus vulvae (15.5%) and pressure sores (0.6%). Similar prevalence of 20.2% and 22.19% were respectively reported for vulvar dermatitis in Borno and Sokoto States of Nigeria [16] [32]. These symptoms usually improve significantly following successful closure of the fistula and improved hydration. Liberal oral fluids and application of barrier ointment are encouraged before fistula repair.

Neurological injuries were found in 30.4% of participants. Though not statistically significant ($P = 0.171$), a higher proportion of women with gait abnormalities were primipara (40.0%) compared to those who were grandmultipara (29.5%) and multipara (23.9%). Prevalence of obstetric nerve palsy of 18.2%,

20.3% and 23.3% were reported in Osun, Kano and Sokoto of Nigeria [15] [16] [20]. The mechanism of injury is related to nerve compression or a stretch injury at susceptible sites [33] [34]. The median duration of symptoms is six to eight weeks with resolution or improvement, except with severe prolonged compression or in patients who have a pre-existing neuropathy [33] [34]. Approximately half of the participants presented at 6 months or less from the development of the fistula, which could account for the relatively higher prevalence of obstetric nerve palsy found in this study. Physiotherapy should be incorporated into the management of women with obstetric fistula.

Majority 122 (75.8%) of the participants reported social restrictions as a result of their condition while a tenth of them 19 (11.8%) reported suicidal ideation. The psychological effects of the injuries can be more devastating than the physical injuries sustained. These women are often abandoned, marginalized and stigmatized for constantly leaking urine, faeces or for being childless. They often restrict their movements in order to avoid the shame of being isolated for the offensive smell that emanates from them [9] [35]. Early repair is advocated as this may improve their psychosocial status.

The study is limited by the fact that it was a cross-sectional one and as such it did not demonstrate the effects of obstructed labour injuries on the outcomes of treatment.

5. Conclusion

Almost all fistula patients also have non-fistulous complications of prolonged obstructed labour. Efforts to manage the fistula should equally address these complications. We advocate comprehensive care for identification and management of these injuries to improve the quality of life and overall well-being of these women. To reduce complications such as cervical retraction, there should be an emphasis on safer caesarean section for women with prolonged obstructed labour as this was the mode of delivery in about two-thirds of the women studied.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix Questionnaire

Non-Fistulous Complications of Prolonged Obstructed Labour among Obstetric Fistula Patients in Southern Nigeria

Serial number

(A) Biodata

- 1) Age (years) as at last birthday:
- 2) Occupation:
- 3) Marital status: Single [] Married [] Divorced [] Separated []
Widowed []
- 4) Husband's occupation:
- 5) Highest level of education attained: No formal Education []
Primary [] Secondary [] Tertiary [] Postgraduate []
- 6) Husband's highest level of education attained: No formal Education []
Primary [] Secondary [] Tertiary [] Postgraduate []
- 7) Religion: Christianity [] Islam [] African traditional religion []
Others []
- 8) Ethnicity: Yoruba [] Igbo [] Hausa [] Others [],
specify

(B) Obstetric history

- 1) Parity:
- 2) Number of children alive:
- 3) Last confinement (in months):
- 4) Gestational age at delivery: Term [] Pre-term [] Post-term []
- 5) Antenatal care: Yes [] No []
- 6) If yes to the question above, number of visits:
- 7) Place of delivery: Home [] 1^o Health Centre []
2^o Health Centre [] 3^o Health Centre [] Private Maternity []
TBA [] Religious Centre []
- 8) Skilled birth attendant: Yes [] No []
- 9) Duration of labour (hours)
- 10) Mode of delivery: SVD [] CS [] Assisted vaginal delivery []

- 11) Weight of the baby.....kg Don't know []
- 12) Fetal outcome: Alive & well [] Still birth []
 Alive but developmentally impaired []
- 13. Catheterization: Yes [] No []
- 14. Duration of catheterization (days):
- 15. Blood transfusion: Yes [] No []
- 16. If yes to the question above, number of pints:
- 17. Number of days on admission:

(C) Obstructed labour injuries identified

a) Urological injury

- 1) Duration of urine leakage (in months):
- 2) Type(s) of fistula:
- 3) Estimated size (cm) of fistula:
- 4) Number of fistula:
- 5) Complete urethral loss: Yes [] No []
- 6. Partial urethral loss: Yes [] No []
- 7) Circumferential defect: Yes [] No []
- 8) Bladder stone: Yes [] No []
- 9) Urinary tract infection: Yes [] No []

b) Gynaecological injury

- 1) Vaginal scarring: Yes [] No []
- 2) Vaginal stenosis: Yes [] No []
- 3) Cervical retraction: Yes [] No []
- 4) Cervical defect: Yes [] No []
- 5) Amenorrhoea: Yes [] No [] Not Applicable []
- Infertility: Yes [] No [] Not Applicable []
- Dyspareunia: Yes [] No []

c) Gastrointestinal injury

- 1) Rectovaginal fistula: Yes [] No []
- 2. Anal sphincter damage: Yes [] No []

d) Musculoskeletal injury

1) Osteitis pubis: Yes [] No []

e) Neurological injury:

1) Foot drop: Yes [] No []

f) Dermatologic injury:

1) Ammoniacal dermatitis: Yes [] No []

2. Pressure sores: Yes [] No []

3. Pruritus vulvae: Yes [] No []

g) Psychosocial problems

1) Depression: Yes [] No []

2) Suicidal ideation: Yes [] No []

3) Social restrictions Yes [] No []

h) Any other injury identified?

please specify.....

(D) Other Parameters

Nutritional Status

1) Height (m):

2) Weight (kg):

3) BMI (Kg/m²):

Haematological

1) Packed Cell Volume at first presentation (%):

Normal ($\geq 30\%$) [] Mild anaemia (27% - 29%) []

Moderate (19% - 26%) [] Severe (<19%) []

E) Outcome of obstetric fistula repair

1) Successful (no involuntary leakage of urine as a result of residual fistula) []

Failed (involuntary leakage of urine as a result of residual fistula) []

2) Post operative stress incontinence: Yes [] No []