



## Vesicovaginal Fistula: A Review of Nigerian Experience

*La fistule vésico-vaginale: Un examen de l'expérience nigériane*

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### ABSTRACT

**BACKGROUND:** Vesicovaginal fistula is a preventable calamity, which has been an age-long menace in developing countries.

**OBJECTIVE:** To review the causes, complications, and outcome of vesicovaginal fistula in Nigeria.

**METHODS:** Studies on vesicovaginal fistula were searched on the internet. Information was obtained on Pubmed (medline), WHO website, Bioline International, African Journal on Line, Google scholar, Yahoo, Medscape and e Medicine.

**RESULTS:** Many Nigerian women are living with vesicovaginal fistula. The annual obstetric fistula incidence is estimated at 2.11 per 1000 births. It is more prevalent in northern Nigeria than southern Nigeria. Obstetric fistula accounts for 84.1%–100% of the vesicovaginal fistula and prolonged obstructed labour is consistently the most common cause (65.9%–96.5%) in all the series. Other common causes include caesarean section, advanced cervical cancer, uterine rupture, and *Gishiri* cut. The identified predisposing factors were early marriage and pregnancy, which were rampant in northern Nigeria, while unskilled birth attendance and late presentation to the health facilities was common nationwide. Among the significant contributory factors to high rate of unskilled birth attendance were poverty, illiteracy, ignorance, restriction of women's movement, non-permission from husband, and transportation. All but one Nigerian studies revealed that primiparous women were the most vulnerable group. Pregnancy outcome was dismal in most cases related to delivery with still birth rate of 87%–91.7%. Stigmatization, divorce and social exclusion were common complications. Overall fistula repair success rate was between 75% and 92% in a few centres that offer such services.

**CONCLUSION:** Vesicovaginal fistula is prevalent in Nigeria and obstetric factors are mostly implicated. It is a public health issue of concern. WAJM 2010; 29(5): 293–298.

**Keywords:** Vesicovaginal fistula, Aetiology, Contributory factors, Prevention, Nigeria.

### RÉSUMÉ

**CONTEXTE:** la fistule vésico-vaginale est une calamité évitables, qui a été une menace séculaire dans les pays en développement.

**OBJECTIF:** Passer en revue les causes, les complications, et le résultat de la fistule vésico-vaginale au Nigeria.

**MÉTHODES:** Les études sur la fistule vésico-vaginales ont été recherchées sur Internet. L'information a été obtenue sur PubMed (Medline), site de l'OMS, Bioline International, Revue Africaine sur la ligne, Google scholar, Yahoo, et Medscape e médecine.

**RÉSULTATS:** De nombreuses femmes nigérianes sont atteintes de la fistule vésico-vaginale. L'incidence de la fistule obstétricale annuelle est estimée à 2,11 pour 1000 naissances. Il est plus répandu dans le nord du Nigeria que le sud du Nigeria. Les fistules obstétricales représentent 84,1% -100% de la fistule vésico-vaginale et prolongée dystocie est toujours la cause la plus fréquente (65,9% -96,5%) dans toutes les séries. D'autres causes fréquentes peuvent inclure une césarienne, le cancer avancé du col utérin, de rupture utérine, et *Gishiri* coupe. Les facteurs prédisposants ont été identifiés mariages et grossesses précoces, qui sévissaient dans le nord du Nigeria, alors que la fréquentation de naissance non qualifiés et la présentation tardive aux services de santé a été commune à l'échelle nationale. Parmi les facteurs importants contribuant au taux élevé d'accouchements en présence de travailleurs non qualifiés sont la pauvreté, l'analphabétisme, l'ignorance, la restriction du mouvement des femmes, la non-autorisation de son mari, et le transport. Toutes, sauf une étude nigériane a révélé que les femmes primipares ont été le groupe le plus vulnérable. Issue de la grossesse a été lamentable dans la plupart des cas liés à la prestation des taux de natalité encore de 87% -91,7%. La stigmatisation, le divorce et l'exclusion sociale étaient des complications fréquentes. Globalement le taux de réussite a été la fistule entre 75% et 92% dans quelques centres qui offrent de tels services.

**CONCLUSION:** fistule vésico-vaginale est courante au Nigeria et en obstétrique facteurs sont principalement en cause. Il s'agit d'un problème de santé publique de portée. WAJM 2010; 29 (5): 293–298.

**Mots-clés:** la fistule vésico-vaginale, étiologie, facteurs favorisants, la prévention, au Nigeria.

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Abbreviations: VVF, Vesicovaginal fistula.

## INTRODUCTION

Confinement is a life-changing event which is a pleasant and joyful experience for many mothers. On the other hand, it is a difficult and regretful period for others particularly, when it is accompanied by serious illness, debilitating injuries and death of the baby, mother or both. About half a million women die yearly from causes related to pregnancy and delivery and for each maternal death approximately 10–15 other women sustain serious morbidity including vesicovaginal fistula.<sup>1–5</sup> Thus vesicovaginal fistula (VVF) can be described as aftermath of a 'near miss maternal death'.

Vesicovaginal fistula appears to have been in existence since antiquity evident by references made to genital fistula in Ebers papyrus and in an Egyptian mummy in 2000BC and 2050BC respectively.<sup>5</sup> Vesicovaginal fistula is a preventable disease but is prevalent among the less privileged and marginalized members of the population; the poor, young, illiterate girls and women in the remote rural areas of the world, where access to emergency obstetric care, family planning services and skilled birth attendance are unavailable and where available poorly utilized.<sup>2</sup>

There are large differences in the incidence of vesicovaginal fistula among populations. Globally, over two million women are estimated to be living with vesicovaginal fistula and majority are in Sub-Saharan Africa and South Asia.<sup>6</sup> The reported incidence rates of vesicovaginal fistula in West Africa range between 1–4 per 1,000 deliveries.<sup>7–9</sup> An annual obstetric fistula incidence is estimated at 2.11 per 1000 births<sup>10</sup> from 100,000–1,000,000 Nigerians live with obstetric fistula.<sup>11</sup> Over 70,000 Bangladeshi women live with obstetric fistula<sup>12,13</sup> and about 9,000 new cases occur each year in Ethiopia.<sup>14</sup> It is however not impossible that some of these incidences/prevalence are under reported.

Prolonged obstructed labour is the major cause of vesicovaginal fistula in the developing countries.<sup>6,7,15–17</sup> It is one of the five leading causes of maternal mortality in Nigeria and accounts for 8% of global maternal deaths. Obstructed labour- vesicovaginal fistula complex is

rarely encountered in the industrialized countries of the world,<sup>4,6,7</sup> this is one of the most visible indicators of the enormous gap in maternal health care between the developed and developing countries.

Efforts are being made by some governmental and non governmental organizations to reduce the incidence of or eradicate vesicovaginal fistula. Among them are some northern Nigeria state governments, World Health Organization and UNFPA to mention but few.

Many studies in Nigeria have described varying contributing factors to vesicovaginal fistula. These studies were conducted in various parts of the country. Vesicovaginal fistula is still common despite its preventable nature. Hence, the rationale for this study was to document the national outlook of the condition. The objectives of the study were to review the contributory factors and causes of vesicovaginal fistulas, associated conditions/ complications and outcome of vesicovaginal fistula repair.

## SUBJECTS, MATERIALS, AND METHODS

We reviewed all accessible relevant published studies on vesicovaginal fistula in Nigeria. Papers that did not address the issues examined in this review were excluded. The health facilities where the studies were done were spread across the country (Fig. 1). Studies on vesicovaginal fistula were searched on the internet. Information was obtained on Pubmed (medline), WHO website, Bioline international, African journal on line, Google scholar, Yahoo, Medscape and e medicine. There was no relevant information on the database of the Cochrane library and WHO Reproductive health library.

The key words used included vesicovaginal fistula; obstetric fistula; fistula; urogenital fistula; vesicovaginal fistula epidemiology; vesicovaginal fistula prevalence; vesicovaginal fistula causes; vesicovaginal fistula prevention; and vesicovaginal fistula repair. Other key words were vesicovaginal fistula Nigeria; developing countries; low resource countries and developed countries. These were used in separate

or in string pattern. In addition, information from textbooks was also used.

The profile analyzed included patients age, age at marriage, level of education, occupation, antenatal booking status, place of delivery and mode of delivery. Other information included reasons for delay in seeking care, aetiology of vesicovaginal fistula, perinatal outcome, complication associated with vesicovaginal fistula, and vesicovaginal fistula repair outcome.

The limitation of this study is that all the reviewed studies are health facility based. The definition of successful vesicovaginal fistula repair is not clearly stated in most of the studies. To the best of the author's knowledge there is no community based study on vesicovaginal fistula in Nigeria.

## RESULTS

In Kano series, 120 vesicovaginal fistula patients were admitted in two months.<sup>18</sup> Maiduguri, Jos and Sokoto studies reported 241 cases in two years,<sup>19</sup> 932 cases in seven and half years<sup>20</sup> and 31 cases in one year<sup>21</sup> respectively. Forty-four cases in ten years and 27 cases in seven years were seen in Ilorin<sup>22</sup> and Sagamu<sup>23</sup> respectively. Waaldijk Kmanaged 1,716 fresh obstetric fistula cases (VVF of less than three months duration) in nine years in Katsina and Kano fistula centres.<sup>24</sup> Inimgba et al in Port Harcourt reported the lowest rate of 45 cases in 14 years.<sup>25</sup> Rectovaginal fistula coexisted with vesicovaginal fistula in 12.5%, 11% and 6% of cases in Sagamu,<sup>23</sup> Jos<sup>20</sup> and Kano<sup>18</sup> studies respectively. Foot drop was present in 23% of cases in Kano series.<sup>18</sup> Tsui *et al* analysed data on 3,552 deliveries in Nigeria (1996–1999) with logistic regression models and found the annual obstetric fistula incidence estimated at 2.11 per 1000 births.<sup>10</sup>

### Age at Marriage

Most of the vesicovaginal fistula patients in northern Nigeria had early marriage; 93.6% of Sokoto patients were married before or at 18 years of age,<sup>21</sup> and 81.5% of Kano patients<sup>18</sup> and 52.3% of Maiduguri fistula patients<sup>19</sup> got married by 15 years of age. The mean age of

marriage for Sokoto fistula patients was 13 years<sup>21</sup> and 15.5 years for Jos patients<sup>20</sup>. In the series by Wall *et al* in Jos, 39.1% of the patients were married before attaining menarche.<sup>20</sup> From prospective comparative study of obstetric fistula in Gombe, the average age at first marriage was 14 years for the obstetric fistula patients compared with 21.3 years for the controlled group.<sup>26</sup>

### Age at Presentation

The peak age group of occurrence of vesicovaginal fistula was 10–18 years in Sokoto (90%)<sup>21</sup>, Kano (72.5%)<sup>18</sup> and Maiduguri studies (58.8%).<sup>19</sup> Patients younger than 16 years accounted for 42.4% in Waaldijk's series.<sup>24</sup> The highest frequency age group was 20–29 years age bracket in Sagamu (58.3%)<sup>23</sup> and Inimgba in Port Harcourt (52.5%).<sup>25</sup> In Maiduguri, 20–24 years age bracket had the peak frequency of VVF cases (33.8%), followed by 15–19 years age group (21.3%).<sup>27</sup>

### Parity and History of Preceding Pregnancy

Primiparas were the affected group in most centres in Nigeria namely Sokoto (81%)<sup>21</sup>, Jos (45.8%)<sup>20</sup>, Ilorin (43.2%)<sup>22</sup>, Sagamu (50%)<sup>23</sup> and Maiduguri (51.3%).<sup>27</sup> In Port Harcourt, many of the patients were multiparas (64.5%).<sup>25</sup> Majority of obstetric fistula patients did not receive

antenatal care during pregnancy. In the series from Sokoto, Kano and Jos, 72–77% of the patients did not receive antenatal care respectively.<sup>18,20,21</sup> About 90% of Maiduguri patients,<sup>27</sup> 70.8% of Sagamu patients<sup>23</sup> and 47% of Jos patients<sup>20</sup> had unskilled birth attendance in preceding pregnancy. Only 3.8% of Obstetric fistula patients in Gombe had a live birth in preceding deliveries.<sup>26</sup>

Pregnancy outcome was dismal in most cases related to delivery. Stillbirth rate of 87%–91.7% were recorded in Jos, Ile-ife, and Sokoto respectively.<sup>4,20,21</sup>

### Aetiological Factors

Figure 2 reveals the proportion of obstetric and non-obstetric vesicovaginal fistula in various centres. The entire vesicovaginal fistulas recorded in sokoto<sup>21</sup> were obstetric related while 84.1%, 94.4% and 95.6% obstetric fistulae were reported by Ijaiya *et al* in Ilorin,<sup>22</sup> Orji *et al* in Ile-Ife<sup>4</sup> and Inimgba *et al* in Port Harcourt<sup>25</sup> respectively. Table 1 shows aetiological factors of vesicovaginal fistula. Prolonged obstructed labour was the most common cause of vesicovaginal fistula in all the series in Nigeria, where it accounted for 65.9%–96.5% of cases in Jos, Sagamu, Port Harcourt, Maiduguri and Ilorin.<sup>19,20,22,23,25</sup> Gishiri cut (incision made on the anterior vaginal wall by Hausa traditional health practitioners to treat infertility, amenor-

rhea or to relieve obstructed labour) accounted for 6.2% cases in Maiduguri<sup>19</sup> and 2.3% cases in Jos.<sup>11</sup> No case of Gishiri cut was recorded in Sagamu,<sup>23</sup> Port Harcourt<sup>25</sup> or Ilorin<sup>22</sup> series. Other common causes included gynaecological operations, advanced cervical cancer, caesarean section, forceps delivery, uterine rupture, cranio-tomy and traumatic vaginal laceration from fall.<sup>4,18–23,25–29</sup>

### Reasons for Delay in Seeking Care

Data from Jos on reasons for delay in seeking care in obstructed labour cases included non permission from husband/family to seek emergency obstetric care (28%), lack of accessible transportation (25%) and attempted traditional remedies (7.4%). Other reasons were unawareness of availability of hospital obstetric care (6.5%), unavailability of health facility (5.6%), while 26.8% had no reason.<sup>20</sup>

### Family and Social Data

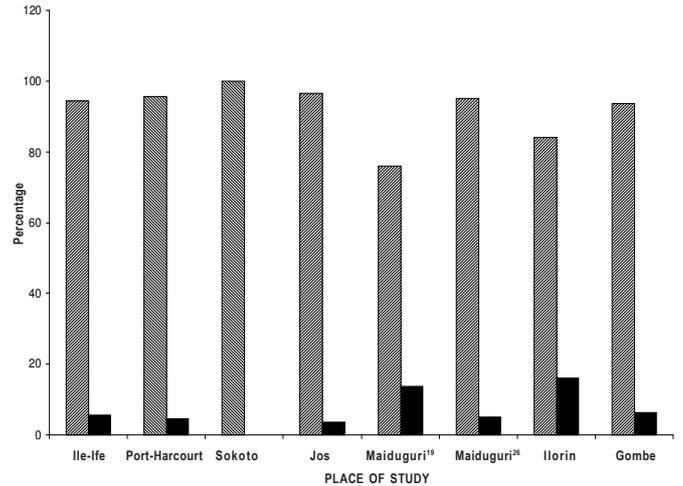
The bulk of the vesicovaginal fistula patients in Nigeria had no formal education. In Ilorin, Kano, Jos and Sagamu series, the non-literate patients accounted for 88.6%<sup>20</sup>, 78.3%<sup>18</sup>, 77.9%<sup>20</sup> and 75%<sup>23</sup> respectively. In Sokoto, 61% of the patients were full time housewives and the remaining 39% were home-based petty traders.<sup>21</sup>

**Table 1: Distribution of Vesicovaginal Fistula Cases in Nigeria Health Facilities by Aetiology and Site**

| Aetiology                                  | Number (%)           |                         |                         |                      |                      |                             |                     |
|--|----------------------|-------------------------|-------------------------|----------------------|----------------------|-----------------------------|---------------------|
|  | Sokoto <sup>21</sup> | Maiduguri <sup>19</sup> | Maiduguri <sup>26</sup> | Ilorin <sup>22</sup> | Sagamu <sup>23</sup> | Port Harcourt <sup>25</sup> | Gombe <sup>26</sup> |
| N  | 31                   | 241                     | 80                      | 44                   | 24                   | 45                          | 80                  |
| Obstructed Labour                          | 31 (100)             | 183 (73.9)              | 68 (85.0)               | 29 (65.9)            | 22 (91.7)            | 39 (86.8)                   | 75 (93.7)           |
| Caesarean Section                          | -                    | -                       | 8 (10.0)                | 3 (12.5)             | 2 (8.3)              | 2 (4.4)                     | -                   |
| Forceps Delivery/<br>Instrumental Delivery | -                    | -                       | -                       | 1 (2.3)              | -                    | 2 (4.4)                     | -                   |
| Advanced Cervical Cancer                   | -                    | 4 (1.7)                 | 2 (2.5)                 | 6 (13.6)             | -                    | 1 (2.2)                     | -                   |
| Gishiri Cut                                | -                    | 15 (6.2)                | 2 (2.5)                 | -                    | -                    | -                           | 3 (3.8)             |
| Uterine Rupture                            | -                    | -                       | -                       | 3 (6.8)              | -                    | -                           | -                   |
| Caesarean Hysterectomy                     | -                    | -                       | -                       | 1 (2.3)              | -                    | -                           | -                   |
| Total Abdominal<br>Hysterectomy            | -                    | -                       | -                       | 1 (2.3)              | -                    | -                           | -                   |
| Surgical Trauma                            | -                    | 9 (3.1)                 | -                       | -                    | -                    | -                           | 2 (2.5)             |
| Traumatic Vaginal Laceration               | -                    | -                       | -                       | -                    | -                    | 1 (2.2)                     | -                   |
| Infection                                  | -                    | 5 (2.1)                 | -                       | -                    | -                    | -                           | -                   |
| Unknown                                    | -                    | 25 (10.3)               | -                       | -                    | -                    | -                           | -                   |



**Fig. 1: Map of Nigeria Showing the Locations of Centres that Provided Data for this Review**



**Fig. 2: Proportion of Obstretic VVF (hatched bars) and Non-Obstretic VVF Cases in Nigerian Health Facilities**

One third of Kano patients had psychological depression and over half suffered from societal negative reaction.<sup>18</sup> Divorce was common generally among Nigeria vesicovaginal fistula patients. Divorce rates were 55%, 48.9%, 23.5% and 22.4% in Sokoto<sup>21</sup>, Jos<sup>20</sup>, Ilorin<sup>22</sup> and Maiduguri<sup>19</sup> studies respectively. In addition 22.1% of the patients were separated in a Jos series.<sup>20</sup>

**Gynaecological Complications**

In Kano vulval dermatitis (31.0%) was the most common complication followed by secondary amenorrhoea.<sup>20</sup> The latter was the most common gynaecological complication among VVF patients in Southeastern Nigeria<sup>30</sup> and Ilorin.<sup>29</sup> Other complications included gynaesthesia, dyspareunia and infertility.<sup>18,29</sup>

**Outcome of Vesicovaginal Fistula Repair**

Overall success rates of vesicovaginal fistula repair were 92%, 75% and 87.9% in Jos<sup>20</sup>, Port Harcourt<sup>25</sup> and Ilorin<sup>22</sup> series respectively. In Ile-Ife, the overall success rate was 91.5%.<sup>4</sup>

**DISCUSSION**

Vesicovaginal fistula is a preventable condition, which is prevalent in Nigeria and most poor resource countries of the world.<sup>15,16,26</sup> The true incidence and prevalence of this condition in the communities are unknown and impossible to obtain since the areas with high overall prevalence are those where cases are unknown to

medical services and poor general epidemiological data collection. For West Africa the estimated incidence rate for vesicovaginal fistula is 1–4 per 1000 births.<sup>8,9</sup> The annual obstetric fistula incidence for Nigeria has been estimated at 2.11 per 1,000 deliveries.<sup>10</sup> Between 100,000–1,000,000 Nigerian women are estimated to be living with vesicovaginal fistula.<sup>31</sup> Contrary to the widely held believe among Nigerians that vesicovaginal fistula is a disease of the northern Nigeria, studies from the southern Nigeria have shown that vesicovaginal fistula does exist in the south but is more prevalent in the northern part of the country.<sup>4,18-23,25-28</sup> An estimated 50,000- 100,000 new cases occur annually in Nigeria, hence it is a major public health problem.<sup>16</sup> In contrast, an estimated annual incidence of 250 cases of vesicovaginal fistula occur per year in the whole of England and Wales, which are entirely from non-obstetric origin.<sup>5</sup> Obstetric fistula therefore has been eradicated in the rich countries of the world due to their excellent obstetric care.<sup>21,31-33</sup>

Many of the obstetric fistula patients from the northern Nigeria are teenagers. It is noteworthy that early marriage and pregnancy had been known to contribute to development of vesicovaginal fistula since the time of Avicenna in 950AD<sup>5</sup>. The youngest age of patient with obstetric vesicovaginal fistula in Nigeria was 10years as reported by Kabir et al in Kano.<sup>18</sup> The average age

of the vesicovaginal fistula patients in studies from northern Nigeria are 13years for Sokoto<sup>21</sup> and 17.5years for Maiduguri<sup>19</sup>, while Port Harcourt, Ilorin, and Sagamu patients mean ages are 26.8years<sup>25</sup>, 29.3years<sup>22</sup> and 30.2years<sup>23</sup> respectively. A marked difference in the age at marriage in the regions of Nigeria exists. Early marriage is commonly practised in the northern part of Nigeria, and sometimes girls are given out in marriage before or shortly after attaining menarche as reported by Lewis et al in Jos, where 39.1% of the patients were married before attaining menarche.<sup>20</sup> Besides, most of the patients were not aware of contraception talk-less of using it. This is not surprising because contraceptive prevalence rate for Nigeria is generally low at 10%.<sup>34</sup> Early marriage without contraception is invariably followed by early pregnancy, at a time the pelvis is not developed enough for easy passage of the foetus through the maternal pelvis leading to cephalopelvic disproportion.

Majority of vesicovaginal fistula patients are non-literate from poor homes.<sup>18-23</sup> All Nigerian studies but one (Port Harcourt study) revealed that primiparous women were the most vulnerable group.<sup>4,18-23,28,29</sup> The highest frequency observed among primiparae in Sokoto was attributed to early marriage.<sup>21</sup>

Contrary to industrialised countries, where hysterectomy is the most common cause of vesicovaginal fistula, obstetric injuries account for the bulk of the

vesicovaginal fistula seen in Nigeria, in the range of 84.1% and 100%.<sup>4,21,22,25</sup> This is typical of sub-Saharan Africa and south Asian countries.<sup>15,16,28</sup> Pressure necrosis from prolonged obstructed labour is the most common cause of vesicovaginal fistula in Nigeria and most developing countries.<sup>4,18–23,25–29</sup> These observations made by Lawson about four decades ago are still very much the same today.<sup>23</sup> Other common causes include uterine rupture, advanced carcinoma of the cervix, caesarean section, forceps delivery, craniotomy and Gishiri cutting, which is peculiar to the Hausa people of the northern Nigeria.<sup>18–20,31</sup> Occasionally, cases of vesicovaginal fistula secondary to insertion of corrosive substances into the vagina, straddle injury and female genital cutting are encountered in Nigeria.<sup>4,18–23</sup> Fistula from radiation therapy for carcinoma is uncommon in Nigeria because radiotherapy machine is not readily available and the fee for complete treatment is unaffordable to many cancer patients. In contrast to Ethiopia where 1.2% of the vesicovaginal fistula cases reported are caused by rape<sup>32</sup> there is no such case reported in Nigeria.<sup>4,18–23</sup>

In less developed countries, a third of all pregnant women receive no health care in pregnancy and 60% of all deliveries take place outside health facilities.<sup>34</sup> Only 35% of Nigerian deliveries are attended by trained staff.<sup>34</sup> This is contrast to 99% and 100% skilled birth attendance recorded for United Kingdom and Japan respectively.<sup>34</sup>

Majority of Nigerian obstetric fistula patients delivered at home and had unskilled birth attendance or attempted to deliver at home and eventually presented late to a health facility when labour had been obstructed for long time.<sup>4,20,21</sup> This could be as a result of constellation of factors, which could be explained by the three delay model such as a delay in deciding to seek care due to community or socio-cultural factors, being unaware of the warning signs of difficult labor, need for care, unaffordability of hospital fee for vaginal or abdominal delivery and use of health facility as last resort. Unskilled birth attendant service such as traditional birth attendant service is widely patronised

because it is more affordable and allows payment in installment hence it is financially convenient for the poor patients.

In northern Nigeria, a woman cannot take decision to go to health facility if her husband is not at home. There is a strong belief that women's movement must be under strict male control and permission from the husband or a suitable male surrogate must be obtained before money can be spent on health care. This is the most common cause of delay in seeking care in obstructed labour in vesicovaginal fistula patients.<sup>20</sup> Delay in transporting patients to the health facility is the next common cause of delay,<sup>19</sup> which could be due to long distance, non availability of vehicle, or bad road. Health facilities are not available in some communities and the available ones are very far.

Other contributory factors include delay in receiving prompt treatment. Unfriendly attitude of healthcare providers to patients discourages patients from seeking care at the health facilities. Many health facilities that provide basic and comprehensive emergency obstetric care are understaffed, without partograph for monitoring labour or proper referral backup. In many health facilities drugs are out of stock, patients are given list of drugs and materials for caesarean section to procure outside the health facility and incessant power outage that delays sterilization of instruments and surgery, which may delay time of relieving obstruction and worsening complications.

Most of the vesicovaginal fistula patients suffer from unnecessary and avoidable psychosocial complications such as loss of self esteem, divorce/separation and depression. Most patients cannot work or attend social gathering because of smell of urine. The patients' husbands and sometimes their families desert the patients because the urine odour makes them socially unacceptable. It is believed they have brought shame and dishonour to their families and are shunned by the society and eventually become social outcast. For those who remain with their husband they are deprived of sex.<sup>18</sup> Other complications include amenorrhoea and gynaetresia.

Despite successful repair of the fistula some of the patients could not enjoy happy marital life because of dyspareunia from vaginal stenosis or infertility.<sup>18</sup> Therefore, vesicovaginal fistula could be regarded as the most dehumanizing condition to afflict women.<sup>16,22,31</sup>

One of the tragic events associated with vesicovaginal fistula-obstructed labour complex in Nigeria is adverse foetal outcome, which comprises high stillbirth rate of 75%–92%, high birth asphyxia, neonatal sepsis and neonatal mortality.<sup>4,20,21</sup>

A successful surgical repair of vesicovaginal fistula depends on numerous factors such as fistula size, site, surgeons' skill, surgical technique and post operative management. The success rate is high in the few centres that offer vesicovaginal fistula repair (ranges between 75% and 92%).<sup>4,20,22,25</sup> Most vesicovaginal fistulae are repaired through the vagina in lithotomy position. Occasionally, abdominal route is employed for juxtacervical fistulae that are not accessible per vaginam. A successful repair restores patient dignity, self esteem and improves the quality of life.<sup>10,24</sup> Unfortunately, the health facilities and health practitioners in Nigeria that have the expertise to repair vesicovaginal fistula are few to meet the backlog and thousands of new cases that occur every year.

This study suggests that the strategies that are most likely to reduce the occurrence of vesicovaginal fistula are those that will prevent obstructed labour. The following strategies need to be implemented to prevent and eradicate vesicovaginal fistula in Nigeria: The government needs to eradicate poverty, improve the socio-economic condition of the populace and facilitate economic opportunities for women. Educate the public especially the pregnant women and the people involved in decision making. Formal education should be made free and mandatory for girls' up to high school. Legislate against negative traditional practices such as early marriage and childbearing, gishiri cut and gender inequality such as women waiting for permission before seeking medical attention. Transport system should be improved and the less privileged women

can be empowered by introducing them to micro-credit scheme.

Other measures include provision of effective strategies by government to increase attendance of skilled personnel at delivery, provision of affordable and accessible emergency obstetric care and promotion of institutional deliveries. Skilled abdominal and pelvic surgery is necessary to prevent injury to the urinary bladder and vagina. In order to clear the backlog of the existing vesicovaginal fistulas, more training centres should be established and more health practitioners trained in the repair of vesicovaginal fistula. There should be community participation, involvement of men, gatekeepers (influential people in the community), legislative bodies, journalists, human rights activists, other relevant agencies and non-governmental organizations.

Lastly, there may be need for a community based study to determine the true incidence and prevalence of the condition in the community and need for a prospective study with multivariate analysis to ascertain the level of involvement of the possible contributory factors. This will guide in making informed recommendations towards prevention and eradication of the condition.

#### ACKNOWLEDGEMENT

We acknowledge all the authors of the articles reviewed in this study.

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