

## ORIGINAL RESEARCH



# The burden of surgical complications from unsafe abortion treated at the John F. Kennedy Maternity Center (JFKMC), Monrovia, Liberia.

Williams O. Odunvbun<sup>1,2</sup>, Jewel T. Kollie.<sup>1</sup>

1. Department of Obstetrics and Gynaecology, John F. Kennedy Maternity Center, Monrovia. Liberia.

2. Department of Obstetrics and Gynaecology, Faculty of Clinical Medicine, College of Health Sciences, Delta State University, Abraka. Delta State. Nigeria.

\*Corresponding Author: Williams O. Odunvbun, Email; willymeg1@gmail.com

## Abstract

### Background

The burden of surgical complications from unsafe abortion affects both health facilities and patients in most developing countries. This study aimed to determine the nature of surgical complications from unsafe abortion treated at the JFKMC, Liberia, and the estimated cost burden on facility and patient.

### Method

This was a retrospective study of the medical records of patients who had exploratory laparotomy for complications of induced abortion and presented at the JFKMC from June 15, 2018, to December 15, 2019.

### Results

The medical records of 44 out of the 49 patients who had exploratory laparotomy for unsafe abortion were captured and analyzed. Surgical complications from unsafe abortion accounted for 17.8% out of the 276 gynaecological surgeries at the JFKMC, Liberia. The case fatality was 22.4%. The mean age of subjects was 29.00 ± 6.06 years. About 1/3 of the subjects were in their teens, over 4/5 were single, and half were students. Almost 60.0% of the subjects terminated their pregnancies in private health facilities. Ten subjects had a hysterectomy for necrotic/septic uterus. The mean cost of managing a patient with surgical complications from unsafe abortion at the JFKMC was \$331.50, in contrast with \$22.00, for spontaneous or induced abortion with mild complications treated as a day case.

### Conclusion

This study showed a cost burden on the facility, and patients as a result of surgical complications from induced abortion. A shift in current practice by health facilities in Liberia to medical management of abortion and MVA, training of health personnel on the use of MVA, and a less restrictive abortion law with effective contraceptive services are recommended.

**Keywords:** Unsafe abortion, Induced abortion, surgical complication, cost burden, dilatation and curettage.

## Introduction

Unsafe abortion in 2015 accounted for about 7 million women hospitalized in developing countries<sup>1</sup>. The World Health Organization (WHO) defines unsafe abortion as the termination of unintended pregnancy by persons lacking the requisite skills or in an environment not in conformity with medical standards, or both<sup>2</sup>. Almost half of the 42 million unintended pregnancies are terminated in settings considered unsafe, resulting in the death of some 68,000 women, with about 5 million sustaining long-term health complications<sup>3</sup>. The risk of dying from unsafe abortion is highest in Africa<sup>4</sup>. In developing countries, about 220 women die per 100,000 due to unsafe abortions, and in sub-Saharan Africa, mortality from unsafe abortion is 520 per 100,000 cases<sup>4</sup>. Africa bears a disproportionate burden of death from unsafe abortion, accounting for 62% of global death, while home to 29% of unsafe abortions<sup>4</sup>.

Apart from death and morbidities, the collateral effect of unsafe abortion included the direct cost in finance to the patient, her family, and the health system. The annual cost of treating major complications of abortion as reported in 2008 was \$553 million, while in sub-Saharan African countries, \$200 million was spent in out-of-pocket expenses

of individuals and households for the treatment of post-abortion complications<sup>5</sup>.

The 2019-2020 demographic and health survey in Liberia (LDHS) put the maternal mortality ratio at 1,072 per 100,000 live birth, ranking it as one of the highest in the world<sup>6,7</sup>. This figure was far higher than the maternal mortality ratio in sub-Saharan Africa estimated to be 640 per 100,000 live births<sup>2,8</sup>. Unsafe abortion and sepsis occupied the third position among the leading causes of maternal death in Liberia, with each responsible for 10% of maternal death. The leading cause was haemorrhage (25%), followed by hypertensive disease in pregnancy which accounted for 16%<sup>6</sup>. The reported statistics on abortion in Liberia may be lower than actual figures because of undisclosed and secretly performed pregnancy termination due to stigmatization<sup>9</sup>.

For a nation that was yet to recover from the expensive cost of prosecuting a civil war and, more recently, Ebola disease, and with lean budgetary provisions for most sectors of the national economy, including health, the disproportionate burden of managing surgical complications resulting from unsafe abortion on the nation's tertiary health facility may have a negative financial impact on the facility, due to prolonged hospitalization and the inability of most of

the patients to settle their bills. These patients are usually provided with blood products, anaesthesia, oxygen, bed spaces, medications, and feeding. Failure to recover costs could impact negatively on services to other patients.

The JFKMC, is the only fully functional tertiary health facility in Liberia. Most cases of unsafe abortion requiring surgical intervention in Liberia were usually referred to this facility from the fifteen counties. The cost burden on the facility and the patient has not been evaluated. This study aimed to determine the nature of surgical complications from unsafe abortion treated at the JFKMC and estimate the direct cost burden of the surgical complications from unsafe abortion on both the facility and the patient.

**Study Setting:** Legal termination of pregnancy under the Liberian penal law is restrictive.<sup>10</sup> Official request for abortion in the study facility in keeping with the law was only granted following rape, incest, or where the foetus is grossly malformed, or where the child's birth would grossly impair the mother's physical or mental health. The management of the above cases depended on the gestational age of the pregnancy. For first-trimester pregnancies, termination was by Misoprostol and MVA, while pregnancies after the first trimester were by induction of labour, after cervical ripening with Misoprostol, or mechanically with foleys catheter. Other cases of abortion managed at the facility included spontaneous miscarriages with mild complications, incompletely induced abortions, and incomplete septic abortions. All of which were offered post-abortion care (PAC), including emergency management of complications and family planning services. Some of the cases of incomplete abortion resulted from ingestion of Misoprostol purchased or prescribed by patent medicine dealers or by pharmacists. The instrumentally induced abortions with surgical complications requiring exploratory laparotomy were referred from private health facilities operated by physician assistants, midwives, nurse aides, and pharmacists. Media report suggested, that one of the consequences of the restrictive abortion law in Liberia was the practice of 'Spoiling the Belly': The Dangers of Backstreet Abortions in Liberia<sup>11</sup>. This was a practice whereby women seeking to terminate their pregnancy were preyed upon by persons with little or no knowledge of surgical abortion, using all kinds of sharp objects often introduced into the genitalia. The goal was to see blood coming out of the vagina. Some of these patients ended up with severe surgical and septic complications, including uterine and bowel perforations.

There is currently no health insurance coverage in Liberia. The official minimum wage in Liberia for civil servants was 5,600, Liberia dollar (LRD) /month<sup>12</sup>. With a conversion rate of \$ 1.00 to LRD 170.00, this represented \$ 32.94 per month. For unskilled labourers, the minimum wage was LRD 15.00(\$0.09) per hour. This wage profile has an unfavourable implication on the affordability of care by the vulnerable Liberian, and the health-seeking behaviour of the people.

## Methods

This was a retrospective study of the medical records of patients who had exploratory laparotomy at the JFKMC, from June 15, 2018, to December 15, 2019. This represented a period of 18 months.

### Patients' selection:

All patients who presented at JFKMC with a history of induced abortion through instrumentation, after clinical and

ultrasound confirmation of viscera trauma at the emergency unit were included in the study, while patients with clinical and ultrasound features suggestive of gynaecological emergencies not resulting from surgical induction of abortion were excluded.

The total number of gynecological surgeries and the hospital numbers of patients who had exploratory laparotomy for surgical complications from unsafe abortion were obtained from the theater records by the researchers. The case notes were retrieved from the medical record by the staff of the record department. Relevant information on patients' sociodemographic and clinical characteristics were extracted, other information obtained included, clinical findings at presentation, and the operative findings at surgery. This information was transferred to a computer datasheet. Information on billing templates was obtained from the billing (fiscal) unit, theater, and pharmacy.

The direct cost analysis for managing each patient was derived, by adding composite cost from the billing unit for surgical fee and bed charges, the theater department provided the bill for anaesthesia and oxygen, while the pharmacy department was responsible for costing the drugs. The bed charge was a single payment of \$15.00, irrespective of the patient's length of stay. This single bed charge at JFKMC was only for patients in the open ward. The fees at the amenity rooms or private rooms ranged from \$20.00 to \$100.00 per night. None of the subjects was admitted to the amenity facilities. Other charges included, payments for analgesics and antibiotics (\$150.00), anaesthetic medications (\$90.00), operation fee for laparotomy (\$50.00), oxygen charge in the theater (\$25.00), dressing pack(\$1.50/pack). These payments by the patient were out of -pocket.

Ethical approval was obtained from the Institutional Research Board (IRB) of JFKMC. Approval ID: 2021/01/JFK006

## Data analysis

Statistical analysis was done by SPSS version 26.0 (IBM Inc, Chicago IL USA). Data was presented in the form of frequencies and percentages.

## Result

During the review period of 18 months, there were a total of 49 exploratory laparotomies resulting from complications of surgically induced abortion. The medical records of 5 subjects could not be captured, while the remaining 44 or 89.8%, were available for analysis. Exploratory laparotomy for unsafe abortion accounted for 17.8% (49/276) of gynecological surgeries at the JFKMC. The mortality from these cases was 22.4% (11/49).

The mean age of subjects was 29.00±6.06 years. About 1/3 were in their teens, over 4/5 were single, and half were students. All the subjects were Christians. Over 3/4 had been pregnant in the past. (Table 1)

About half (45.5%) of the subjects have had previous pregnancy terminations, thus raising some questions about the unmet need for contraceptive services in Liberia. Thirty-seven (84.1%) patients had surgical complications following an unsafe abortion in the first trimester, while 15.9% were in the second trimester. Almost 60.0 % (26/44) of the illegal pregnancy terminations were conducted in private health facilities, probably due to the restrictive abortion law in Liberia, which only allowed certain types of abortion to be

**Table 1: Sociodemographic characteristics of subjects**

	Frequency	Percentage
Age group (years)		
<20	13	29.5
20 - 29	18	41.0
30 - 39	13	29.5
Marital Status		
Married	4	9.1
Single	36	81.8
Co-habiting	4	9.1
Divorced	0	0.0
Educational qualification		
No formal education	6	13.6
Primary	14	31.8
Secondary	21	47.7
Tertiary	3	6.8
Occupation		
Unemployed	4	9.1
Housewife	0	0.0
Student	22	50.0
Petty trader	15	34.1
Business	3	6.8
Civil Servant	0	0.0
Professional	0	0.0
Religion		
Christianity	44	100.0
Muslim	0	0.0
Others	0	0.0
Parity		
0	15	34.1
1	9	20.5
2	6	13.6
3	5	11.3
4 and above	9	20.5

Mean age 29.00±6.05 (Range = 18 – 39) years

conducted in public health facilities. The mean time interval between termination and patient’s presentation at the JFK Maternity Hospital was 8.58 ±4.59 days. (Table 2).

The mean estimated gestational age of pregnancies terminated: 10.37±3.54 weeks.

The time interval between termination and presentation: 8.58 ±4.59 days. The leading clinical presentations by the subjects were, abdominal pains/ tenderness, abdominal distension, and shock (84.1%, 70.5%, and 43.2%, respectively). Thirty-seven (84.1%) had hypoactive bowel sounds. Offensive vaginal discharge and product of conception plugging the cervical os was observed in 46.3 % and, 19.5% of the cases respectively. In seven cases, there were penetrative injuries at the posterior fornix of the vagina. An abdominal ultrasound

**Table 2. Clinical characteristics of subjects**

	Frequency	Percentage
History of previous termination of pregnancy		
Yes	20	45.5
No	24	54.5
Number of Times		
1	10	50.0
2	6	30
3 and above	4	20.0
Estimated gestational age of pregnancy terminated (weeks)		
4-8	23	52.3
9-13	14	31.8
≥14	7	15.9
The environment in which termination of pregnancy was conducted		
Maternity managed by a nurse/ midwife	7	15.9
Chemist/Pharmacy	4	9.1
Private clinic	26	59.1
Public health facility	3	6.8
Residential apartment	4	9.1
The time interval between termination and presentation(days)		
2-7	23	52.3
8-14	20	45.5
≥15	1	2.3

scan revealed free fluid collection in the peritoneal cavity in 95.3% of the cases. (Table 3)

Findings at laparotomy are shown in table 4: There were multiple perforation sites in 21(47.7%) cases involving the uterus, bowel, and omentum. Posterior uterine perforations were predominant in 47.7% of the cases. Ten subjects had a hysterectomy for necrotic/septic uterus. They all had surgical abortion conducted on them by unskilled personnel in remote counties with associated delays before presenting at JFKMC. Two (16.7%) of the 12 bowel injuries were managed by resection and colostomy. Twenty-eight (63.6%) of the patients had postoperative complications. These included four subjects with repeat laparotomy for drainage of pelvic abscess, colostomy for faecal fistulae, wound breakdown, and worsening anaemia. Eleven of the subjects died on account of septicemia (8), severe anaemia(2), and anaesthetic complication(1). The JFKMC, before January 2021 only had nurse anaesthetists. Currently, with funding support from the world bank, there are now consultant anaesthetists, employed as foreign faculties, thus reducing the risk of complications from anaesthesia.

The study facility, as the only tertiary health facility in Liberia, is a referral center to other public, and private health facilities

**Table 3: Clinical features at presentation**

	Frequency	Percentage
Clinical features at presentation		
Conscious and well oriented	2	4.5
Shock	19	43.2
Vaginal Bleeding	4	9.1
Fever	2	4.5
Abdominal pains and Tenderness	37	84.1
Abdominal Distension	31	70.5
Bowel sound		
Normal	2	4.5
Hypoactive	37	84.1
Absent	5	11.4
Vaginal examination		
Normal	7	17.1
Offensive, purulent vaginal discharge	19	46.3
Offensive bloody vaginal discharge	6	14.6
Product of conception in the cervical os	8	19.5
Signs of perforation present	7	17.1
Ultrasound report		
Retained products of conception in the uterus	15	34.9
Free fluid collection suggestive of perforation	41	95.3

**Table 4: Exploratory laparotomy findings and outcome of surgery**

	Frequency	Percentage
Laparotomy findings		
Only uterine perforation	25	56.8
Uterine and Bowel perforations	12	27.2
Uterine, bowel, and omentum injuries	7	16.0
Description of uterine perforation		
Single	23	52.3
Multiple	21	47.7
Site of perforation		
Anterior	6	13.6
Posterior	21	47.7
Lateral	4	9.1
Fundal	1	2.3
Multiple site	12	27.3
Surgical options for uterine perforation		
Repair of site	34	77.3
Hysterectomy	10	22.7
Surgical options for bowel perforation		
Simple repair	6	50.0
Resection and Anastomosis	4	33.3

**Table 4 Cont...**

Resection and Colostomy	2	16.7
Post-op complication		
Yes	28	63.6
No	16	36.4
Post-operative complications		
Worsening sepsis	13	41.9
Anaemia	9	29
Repeat laparotomy for drainage of abscess	4	12.9
Wound breakdown	17	54.8
Repeat Laparotomy and colostomy	6	19.4
Mortality	11	35.5
Total units of blood transfused		
1-3	22	68.8
≥4	10	31.3
Duration of hospital admission (days)		
<10	15	34.1
10-19	12	27.3
20 - 29	6	13.6
30 and above	11	25

in the country, with resultant overcrowding. Developmental partners, such as, the World bank, WHO, and The Japanese government, are actively helping in expanding health infrastructures, at the JFKMC, and other health facilities in the country, to reduce overcrowding. The mean duration of hospital stay was 18±14.7 days. The minimum length of stay was 3 days, while the maximum length of hospital admission was 60 days

**Discussion**

This study showed that exploratory laparotomy for the complications of unsafe abortion accounted for 17.8% of gynecological surgeries at the JFKMC. It also revealed a case fatality rate of 22.4% among subjects who had laparotomies for severe complications from unsafe abortion. The study tried to establish the cost burden of the surgical complications of unsafe abortion on facility, in comparison with the cost of treating mild to moderate complications from induced or spontaneous abortion.

Surgical complications from unsafe abortion, often associated with severe sepsis, accounted for 16.9% of maternal death at the JFKMC during the study period. It was the third leading cause of maternal death at the facility after haemorrhage and complications of pre-eclampsia/eclampsia. With a case fatality rate of 22.4% among subjects, the surgical complications from induced abortion at the JFKMC was of serious public health concern. Factors contributing to this high case fatality rate included the fact that most of the patients who died presented with septic complications, resulting from the suboptimal environment in which the abortions were conducted, and long delays before presentation. The reasons for delay may have included the fear of the legal consequences of breaking the abortion law in Liberia, lack of money to travel to Monrovia, a hope that the complication will improve, fear of others finding out about



their pregnancy termination, among others. The institutional nature of the study would also have contributed to the high rate. JFKMC, as the apex health facility in the country was a recipient of complicated cases of unsafe abortion from the counties. Those who sought initial care in county facilities were brought with ambulance, while others came on their own. The case fatality from unsafe abortion in sub-Saharan African in 2008 was 0.46%<sup>15</sup>. In the neighbouring country of Sierra Leone, in a multi-center study, the case fatality from unsafe abortion was 1.75%<sup>14</sup>.

The cost of treating severe surgical complications from unsafe abortion in a cross-sectional survey in Malawi in 2015 was \$128 per patient. This contrasted with \$63, \$49, and \$13 per D&C case, MVA, and for a simple PAC, respectively<sup>15</sup>. Several studies have highlighted the burden of unsafe abortion as it relates to the health system, besides the morbidity and deaths to the patients<sup>15-19</sup>. The use of MVA in the study facility for mild complications of both induced and spontaneous abortions managed as day cases costing \$22.00, implied a cost-saving of 93.8% compared to the mean cost of \$331.50, for managing severe complications arising from surgically induced abortion referred to the facility. The findings in Kenya, Nigeria, and Malawi revealed cost reduction with uterine evacuation using MVA as a day case compared to D & C with patient admission<sup>14,15,16</sup>.

Measures to prevent or mitigate the burden of unsafe abortion in Liberia would include effective contraceptive services, a less restrictive abortion law, access to safe abortion services, including the training of health personnel on medical abortion with Misoprostol, and the use of MVA. Preventing unintended pregnancy in women of reproductive age is undoubtedly the primary means of reducing complications of unsafe abortion<sup>3</sup>. About half (45.5%) of the subjects have had previous pregnancy terminations. This raised some questions about the unmet need for contraceptive services in Liberia. The mean unmet need for family planning across the reproductive age groups in Liberia was 34%, while for the age -group of 15-19 years, it was 47.2%<sup>6-7</sup>. The large number of single but parous subjects involved in repeated induced abortion in this study underpinned the necessity for an efficient and wider spread of contraceptive services in Liberia. This gap in contraception usage was in contrast with the unmet need for contraception in Sierra Leone among women in the reproductive age group 15-19 years, which was 31.0%, while the average unmet need for all women was 25.0%<sup>21</sup>. In developing countries, 2/3 of unintended pregnancies take place among non-users of any method of contraception<sup>22</sup>. For a country like Liberia with a relatively weak health infrastructure, greater availability, access, and use of contraceptives will considerably reduce unwanted pregnancies and, by extension, the morbidity, and mortality from surgically induced abortion. Even in a resource endowed country like Russia, abortion rates sharply declined with the advent of the modern method of contraception<sup>23</sup>. Arguably, liberalized abortion laws may not always guarantee safe abortions for those in need; rather, improved education and access to well-organized health care services and training of health personnel are required<sup>14</sup>. For example, despite the passage of the Medical Termination of Pregnancy Act in India in the early 1970s, illegal abortion has persisted<sup>24</sup>. The situation is the same in Cambodia, in which, despite a liberal abortion law, women would often abort themselves, before presenting at health facilities<sup>24</sup>.

The World Health Organization recommends MVA for first-trimester abortion. Capacity building for health personnel using MVA, and a less restrictive abortion law, as different advocacy groups are currently canvassing in Liberia, will go a long way in reducing the burden of surgical, and septic complications from unsafe abortion in the country. The efficacy of Misoprostol alone for first-trimester medical abortion is well known<sup>26</sup>. In Liberia, this method of abortion was only used for those covered by the law in public health facilities or patients who presented at the facility after ingesting Misoprostol privately.

The strength of our study included the fact that study facility was the main referral hospital handling severe surgical complications resulting from unsafe abortion in Liberia; as a result, findings gave some insight into the burden of unsafe abortion, which could be explored in the general population in future studies. It must be acknowledged that because of the abortion law in Liberia, some of the patients with complications resulting from unsafe abortion may not have presented at the facility.

The limitations of this study included the small sample size which made generalization difficult, the challenge in estimating the direct cost of managing the surgical complications from unsafe abortion on the patient, and the facility. It was also difficult to estimate the time lost by the patient from her income, and the long-term reproductive health morbidities.

The need for a population-based or multi-center study on the burden of unsafe abortion in Liberia is highly recommended from the findings of this study to address the gaps observed.

## Conclusion

This study showed a cost burden on facility, and patients as a result of surgical complications from induced abortion. A shift in current practice by health facilities in Liberia to medical management of abortion (MA), manual vacuum aspiration (MVA), complementary training of health personnel on the use of MVA, less restrictive abortion law, and effective contraceptive services are recommended.

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## Conflict of interest

The authors declare that they have no conflict of interest.

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