

Determinants and Prevalence of Post Cesarean Sepsis in Post-Operative Women at Kitagata General Hospital in Sheema District.

Bwanga Fredrick

**Faculty of Clinical Medicine and Dentistry Kampala International University
Western Campus Uganda.**

ABSTRACT

The study evaluated the causes and prevalence of post-cesarean sepsis in post-operative women at Kitagata general hospital. The particular goals were to define social demographic parameters, ascertain post-cesarean sepsis prevalence, and identify health facility elements that were related to it. 42 mothers participated in a descriptive cross-sectional study at Kitagata Hospital among postoperative women. The study revealed that only 8 people (19.0%) experienced sepsis and that having reached the age of 30 or more was a significant risk factor, with an odd ratio of 0.35(0.02-12.20) and a P-value of 0.001. The research revealed that only 8 people (19.0%) experienced sepsis and that having reached the age of 30 or more was a significant risk factor, with an odd ratio of 0.35(0.02-12.20) and a P-value of 0.001. According to the study, 32 (94.1%) of the mothers who did not get sepsis and 7 (87.5%) of the moms who developed post-cesarean sepsis were peasant farmers. The study found that the mothers' parity did not affect the likelihood of sepsis, with an odd ratio of 2.42(1.47-8.50) and a p-value of 0.875. Six (75.0%) of those who had sepsis were those with primary level education and were delivered with less than four births. With an odds ratio of 4.60(1.51-17.25) and a p-value of 0.001, the study also demonstrated that inadequate postnatal care was a significant factor in sepsis occurrence. The majority of those who developed sepsis—5 of whom, or 62.5%—said they had received no health education, and both groups—those who did and those who did not—said the cost of care was high. The study's findings indicate that sepsis occurs frequently (19%), with people over 30 years old being most impacted and claiming high healthcare costs as a major reason (62.5%). Health professionals should ensure that infection prevention measures are used when caring for patients before and after surgery.

Keywords: Post-cesarean sepsis, Post-operative women, Health facility, Adequate postnatal care, Mothers, Health workers.

INTRODUCTION

Caesarean section (CS) is a surgical treatment where an opening(s) is made through a mother's abdomen and uterus to deliver babies [1]. It is mainly done when vaginal delivery would be risky to the child and the mother or done on request for personal reasons [2]. Health Organization, (WHO) suggests caesarean section, should be done only for medical needs, [3]. Post-cesarean sepsis is the invasion and multiplication of microorganisms such as bacteria, viruses or parasites that are not normally present within the body before operation [4]. In 2017, about 23 million CS were done globally. WHO estimated a caesarean section global rate of 10% to 15% [1]. Despite its importance, caesarean sections performed in limited resource settings were highly predisposed to a number of complications where infection is the major complication, particularly in settings that lacked the facilities to conduct safe surgeries or treat potential complications, and infections among others [1]. In Europe, post-cesarean sepsis was less than 5% in all European countries [1]. In Sweden and Australia 7% preferred caesarean section as a method of delivery, 24% in the United Kingdom [5], 26.7% in Ireland and in Rome Italy, the mean incidence was around 44% but could reach as high as 85% in some private clinics [6]. In Africa, there was fewer caesarean section performed but the rate of post-cesarean sepsis was very high compared to the developed world. Hospital Acquired Infections (HAI) prevalence varied between 2.5% and 14.8% in Algeria, Burkina Faso, Senegal and Tanzania [7]. Post-cesarean sepsis had a cumulative incidence in surgical wards that ranged from 5.7% to 45.8% in Ethiopia and Nigeria. In Tanzania, PCS was 2.6% in 2016, in Morocco, HAI was at 17.8%, urinary tract infections at 35% surgical wounds at 32.5% [1] and 14% in Northern Uganda. On average Caesarean section accounts for about 24% of 35 000 births per annum managed by Mulago Hospital. Women giving birth by caesarean section present a 5- to 20-fold greater risk of infection than women giving birth by vaginal delivery. Rates of severe sepsis can be as high as 25%. One of the measures

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applied to prevent infectious complications following caesarean section is the use of prophylactic antibiotics. According to the Sheema District Health Report, 2020, It was noted that in 2017-2019 at Kitagata Hospital, out of the 483 of post caesarean mothers, 13.0 % (63/483) of these mothers developed post-caesarean wound infection. Thus need to assess the prevalence of post-caesarean sepsis, and the possible predisposing factors in mothers undergoing caesarean section as a mode of delivery in Kitagata General Hospital.

Statement of the problem

Globally, approximately 2% to 5% of the 16 million people undergoing surgical procedures each year develop post-caesarean sepsis globally ranging from 2.5% to 41.9% resulting in high morbidity and mortality with more recent data putting it at two-thirds of patients who undergo operations, [8], It is reported that in Sub-Saharan Africa (SSA) sepsis rates are as high as 27.1% and are a major problem in obstetric and gynaecological surgery, especially following caesarean section. They are painful to the patient and costly to society [9], In Uganda, about 10% of the surgical procedures become septic accounting for increasing morbidity and mortality, with the commonest organism isolated being *S. aureus* (20-22) though data on the spectrum of bacteria isolated from hospitalized patients and their antimicrobial susceptibility patterns to guide PCS-therapy in Mulago National Hospital remains scanty [10]. One of the most important risk factors of postpartum infection in both developed and developing countries is caesarean section. This is the second most common cause of maternal mortality and it contributes to 15% of the causes of maternal mortality in Uganda, [11],

Aim

The main objective of the study is to assess the determinants and prevalence of post-caesarean sepsis in post-operative women in Kitagata General Hospital.

Specific Objectives of the study

- ✚ To determine the prevalence of post-caesarean sepsis in post-operative women in Kitagata General Hospital, Sheema district.
- ✚ To establish the social demographic characteristics associated with post-caesarean sepsis among post-operative mothers in Kitagata General Hospital.
- ✚ To find out the health facility-related factors associated with post-caesarean sepsis among post-operative mothers in Kitagata General Hospital.

Research Questions

- i. What is the prevalence of post-caesarean sepsis in post-operative women in Kitagata General Hospital, Sheema district?
- ii. What are the social demographic characteristics associated with post-caesarean sepsis among post-operative mothers in Kitagata General Hospital?
- iii. What are the health facility-related factors associated with post caesarean sepsis among post-operative mothers in Kitagata general hospital?

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METHODOLOGY

Study Design

A descriptive cross-sectional study was done where quantitative method of data collection will be employed on post-operative women at Kitagata hospital. A cross sectional study will be used because it involved interacting directly with these mothers so that the findings will generated from raw source. Quantitative methods will help to ascertain the number of women who developed sepsis after cesarean operation.

Area of Study

The study was carried out at Kitagata Hospital located in Sheema District, Western Uganda. Kitagata Hospital a government hospital with specialized clinics including the ANC/MCH among others. It also comprises of inpatient departments like the surgical, medical, pediatrics and private wards. Most of the people in Sheema district are peasant farmers while those in Kitagata town council practice small scale business. Kitagata is known for its hot spring waters were it delivered its name kitagata. Majority of the people in Kitagata hospital are from catchment areas of Mitooma, Sheema, Bushenyi, Rubirizi, Ntungamo, Buhweju and Mbarara. They live in semi-permanent houses. The investigator chose Kitagata Hospital since the health care workers do not know him and may easily disclose the related information and most of the staffs of Kitagata Hospital speak the same language like that of the investigator.

Study Population

The study was done among post cesarean operative women in Kitagata Hospital who were present during the time of the study.

Sample Size Determination

The sample size was determined using Fishers *et al*, 2015 formula given by the method below,

$$n = \frac{z^2 pq}{d^2}$$

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Where

n= minimum sample sized = margin of error

z=standard normal deviation corresponding to 1.96

p= existing prevalence in south western Uganda, 2.8 % post ceserean sepsis [12].q=1-p

Therefore, taking

$p = 2.8 / 100 = 0.028$ [12].

$z = 1.96$

$q = 1 - p = 0.972$

$d = 5\% \text{ or } 0.05$ $n = \frac{1.96^2 \times 0.028 \times 0.972}{0.05^2}$

n= 42 respondents were recruited into the study.

The sampling method

The study was carried out among post-operative women at Kitagata Hospital in which a convenient method of sampling was employed. Convenient is a non-probability sampling method that entails using the most conveniently available subjects. The research formulated multiple-choice questions in the form of a structured questionnaire.

Inclusion Criteria

The study included all post-operative mothers at Kitagata Hospital who consented to takepart in the study.

Exclusion Criteria

Post-operative women who refused to consent were excluded from the study. Post-operative septic women who were very sick.

Research Instruments

A semi-structured questionnaire containing bio-data of the respondents and questions assessing prevalence, social-demographic factors and health facility-related factors. A tool was pretested in a tenth of the sample size at Ishaka Adventist Hospital for consistency of the questions and any need for adjustment will be made accordingly to meet intended objectives.

Data Analysis and presentation

Data was collected manually, tallied and grouped in the form of tables as applicable and appropriate. Also, the acquired results were analyzed by Microsoft Excel and Statistical Package for Social Science (SPSS) and then eventually presented using tables, bar graphs and pie charts.

Ethical consideration.

After the approval of the research report by the research committee, an introductory letter will be researcher from the faculty of clinical medicine and dentistry research committee of Kampala International University Western Campus which was presented to the stakeholders of Kitagata Hospital to be allowed to collect data. The participants' consent will be obtained by informing them that the information obtained from them will be treated with confidentiality and that their consent will be valued and given utmost respect.

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RESULTS

Table 1: Social demographic characteristics

Variable	Frequency (n=42)	Percentages
Age		
18-30	26	61.9
31-40	10	23.8
More than 40	06	14.3
Education		
Primary Post-primary	22	52.4
	20	47.6
Occupation		
Peasant Formerly employed	27	64.3
	12	28.6
Unemployed	03	7.1
Parity		
Prime gravidae 2-3 birth deliveries	14	33.3
	20	47.7
4 or more deliveries	08	19.0

The mothers were assessed for their social demographic characteristics, regarding the age of the participants, the majority 26(61.9%) were between 18-30 years, 10(23.8%) were between 31 to 40 years while at least 6(14.3%) were more than 40 years. The mothers were assessed for their education level, in which the majority 22(52.4%) had a primary level while at least 20(47.6%) had a post-primary level. The participants were assessed for their occupation in which 27(64.3%) were peasant farmers, 12(28.6%) were formerly employed while least 3(7.1%) were unemployed. The majority of 20(47.7%) of the participants were giving their 2-3 birth delivery, at least 14(33.3%) were prime gravidae while only 8(19.0%) were delivering for 4th or more times.

Table 2: Proportion of mothers who developed post-cesarean sepsis

Variable	Frequency	Percentage
Clinical signs and symptoms present	08	19.0
Clinical signs and symptoms absent	34	81.0

The participants were assessed for clinical signs and symptoms of sepsis, in which only 8(19.0%) had developed sepsis while the majority 34(81%) never developed sepsis.

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Social demographic characteristics with PCS

Table 3: Show social demographic characteristics with post-cesarean sepsis.

Variable	Sepsis n=8		No sepsis		OR(95%CI)	P-value
	Freq.(n)	per cent	Freq.(n)	Per cent		
Age						
Less than 30	03	37.5	23	67.6	Ref	
30 or more years	05	62.5	11	32.4	0.35(0.02-12.20)	0.001
Education						
Primary	06	75.0	16	47.1	3.51(2.33-3.77)	0.002
Post-primary	02	25.0	18	52.9	Ref	
Occupation						
Peasant	07	87.5	32	94.1	0.65(0.04-11.59)	0.025
Unemployed	01	12.5	02	5.9	Ref	
Parity						
Less than 4 deliveries	06	75.0	28	82.4	2.42(1.47-8.50)	0.087
4 or more deliveries	02	25.0	06	17.6	Ref	

N=34

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The social demographic characteristics were assessed in association with sepsis occurrence when assessed for age, The study found that the majority 5(62.5%) of those who had gotten sepsis were 30 or more years while those 23(67.6%) who had not gotten sepsis were below 30 years, the study established that being 30 years of age or more was a significant factor to having sepsis, with an odd ratio of 0.35(0.02-12.20) and P-value of 0.001. The education level of participants was also assessed in regard to sepsis, in which the study showed that the majority 6(75.0%) of those who had had sepsis were those of primary level of education, while the majority 18(52.9%) of those who had not had sepsis had obtained at least a post-secondary education level, the study indicated that being of primary level of education had a positive significance to the occurrence of post-cesarean sepsis at a p-value of 0.002 and odds ratio of 3.51(2.33-3.77). The participants were assessed for their occupation status in correlation to occupancy of post-cesarean sepsis, The majority of both mothers 7(87.5%) who had post-cesarean sepsis were peasant farmers and those 32(94.1%) didn't get sepsis were peasant farmers, the study showed that the nature of one's occupation did not have significance impact on one developing post cesarean sepsis, there was an odd ratio of 0.65(0.04-11.59 and p-value of 0.002. The parity of the participants was also assessed, the majority of both mothers 6(75.0%) who developed sepsis and those 28(82.4%) who did not, were delivered with less than 4 birth deliveries, the study showed that parity of the mothers did not influence the occurrence of sepsis, at an odd ratio of 2.42(1.47-8.50) and p-value of 0.087.

Health facility-related factors and their association with sepsis.

Variable	Sepsis n=8		No sepsis n=34		OR (95%CI)	P-value
	Freq.	%age	Freq.	%age		
Post-natal services available						
Yes	04	50.0	19	55.9	4.60(1.51-17.25)	0.001
No	04	50.0	15	44.1	Ref	
Health education done to mothers						
Yes	03	37.5	20	58.8	Ref	
No	05	62.5	14	41.2	0.85(0.12-2.78)	0.004
Required drugs available						
Yes	02	25.0	18	52.9	Ref	
No	06	75.0	16	41.1	2.32(1.14-19.20)	0.002
Health workers available						
Yes	07	87.5	24	70.6	1.22(0.54-36.50)	0.058
No	01	12.5	10	29.4	Ref	
Cost of care affordable						
Yes	03	37.5	12	35.3	3.32(0.87-5.36)	0.063
No	05	62.5	22	64.7	Ref	

Health-related factors were assessed for their association with post-cesarean sepsis in which the majority of those who never developed PCS noted that they had been given adequate post-natal care, while at least 04(50%) of those who developed sepsis citing that there was no adequate post-natal care extended to them, the study established that lack of adequate postnatal care was a significant factor into leading to the occurrence of sepsis, with an odds ratio of 4.60(1.51-17.25 and a p-value of 0.001. The participants were assessed if health education had been given to them after the cesarean operation on how to care for the incision site, majority 5(62.5%) of those who got sepsis said they had not been given any health education while at least 20(58.8%) of those who never developed sepsis said they had been health educated, the study established that lack of health education to post-cesarean mothers was a contributing factor to occupancy of sepsis, at an odds ratio of 0.85(0.12-2.78) and p-value of 0.004 Post-cesarean mothers were assessed if they had received all the required drugs prescribed after their operation, majority of those who developed sepsis noted that they had not all the drugs because they were unavailable, while at least 18(52.9%) of those who never developed sepsis said they had received their treatment, the study established that failure to receive the prescribed treatments after the cesarean operation was a significant factor to occurrence of post-cesarean sepsis with an odd ratio of 2.32(1.14-19.20 and

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a 0.002 p-value. The mothers were also asked if the health workers taking care of them were always available, the majority of both those 7(87.5%) who developed sepsis and those 24(70.6%) who never developed sepsis said the health workers were always available. The study established that the availability of health workers at the hospital did not significantly affect the occurrence of sepsis among patients. The cost of care was also assessed, and its impact on the development of post-cesarean sepsis, majority of both, majority of both those 5(62.5%) who developed sepsis and those 22(64.7%), said the cost of care was high and had become unaffordable, the study established that the cost of care did not significantly affect the occurrence of post-cesarean sepsis among mothers, at an odds ratio of 3.32(0.87-5.36 and a p-value of 0.063.

DISCUSSION

Proportion of mothers who developed post-cesarean sepsis

The participants were assessed for clinical signs and symptoms of sepsis, in which only 8(19.0%) had developed sepsis while the majority 34(81%) never developed sepsis, this could have resulted from poor care for the incision site or failure to observe aseptic techniques during operation, this study shows a lower percentage prevalence as compared to study results from [13] who indicated that in Mulago Hospital- Kampala, Uganda in 2015 a higher post cesarean sepsis cases of 21% of all women who had been in labour for more than 18 hours.

Social demographic characteristics with PCS

The social demographic characteristics were assessed in association with sepsis, when assessed for age, the study found out that the majority 5(62.5%) of those who had gotten sepsis were 30 or more years while those 23(67.6%) who had not gotten sepsis were below 30 years, the study established that being 30 years of age or more was a significant factor to having sepsis, with an odd ratio of 0.35(0.02-12.20) and P-value of 0.001, the majority of those who got sepsis being above 30 years could be due to poor wound healing among adult persons as a result of reduced body repair and healing, coupled with the fact that some of these mothers could be with previous scars which compromises wound healing, when this study is compared with other studies, it shows a contradiction from a study by [14] who indicated that Post cesarean sepsis after caesarean section was associated with younger age and poor nutrition, their findings had also indicated that, there was a higher incidence of premature rupture of membrane among young mothers which increased post cesarean sepsis rates. Education level of participants was also assessed in regard to sepsis, in which the study showed that majority 6(75.0%) of those who had had sepsis were those of primary level of education, while those the majority 18(52.9%) of those who had not had sepsis had obtained at least a post-secondary education level, the study indicated that being of primary level of education had a positive significance to occurrence of post cesarean sepsis at a p-value of 0.002 and odds ratio of 3.51(2.33-3.77), majority with sepsis being from primary level of education could be because this group of mothers have less access information about safe motherhood and wound care because they may not be able to receive all publication and media messages, which puts them at risk of not knowing how to care for themselves, thus developing sepsis, when compared with other studies, this study shows a correlation with study results by [15] in which they showed that mothers with higher levels of education easily understood the instructions regarding hygienic wound management that resulted in less post cesarean sepsis compared to mothers with low levels of education who did not easily understand the given information. The participants were assessed for their occupation status in correlation to occurrence of post cesarean sepsis, majority of both mothers 7(87.5%) who had post cesarean sepsis were peasant farmers and those who 32(94.1%) didn't get sepsis were peasant farmers, the study showed that the nature of one's occupation did not have significant impact on one developing post cesarean sepsis, there was an odd ratio of 0.65(0.04-11.59 and p-value of 0.002, majority of the participants being peasant mothers could be because the area under study is predominantly occupied by peasant farmers, however doing peasantly domestic work also makes one develop sepsis since they can easily contaminate the incision site, this study shows a similarity with studies by [13] in a study carried out in Qatar, noted that a mothers' occupation influences her chances of post cesarean sepsis after caesarean section, they showed that mothers engaged in casual work tend to work in poorly hygienic environments that exposed them to various pathogens that led to post cesarean sepsis, another comparatively correlative study carried out in Kenya [16] had showed that, mothers who did not have high paying jobs had higher incidence of post cesarean sepsis after caesarean section compared to their counterparts with highly paying jobs. Mothers with better jobs afforded better health care compared to their counterparts with low paying jobs. The parity of the participants was also assessed, the majority of both mothers 6(75.0%) who developed sepsis and those 28(82.4%) who did not, were delivering with less than 4 birth deliveries, the study showed that parity of the mothers did not influence occurrence of sepsis, at odd ratio of 2.42(1.47-8.50) and p-value of 0.087, the majority of the mothers having been delivering their less than fourth delivery, could be because majority were in their youthful reproductive years, coupled with the fact that many people use contraceptive methods and produce less children, this study shows a contradiction from study by [14] in maternity unit of Kiambu district hospital- Central province- Kenya, caesarean section rate was 7.8% with overall post caesarean sepsis being quite high (19%), they noted that among the prime gravidae woman who labored for

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>12hours, the incidence of wound infections was 33% compared 15% among those who labored for 12hours or less, only 5.5% of multigravidamothers who had labored for more than 12 hours developed sepsis.

Health facility related factors and their association with sepsis

Health related factors were assessed for their association with post cesarean sepsis in which majority of those who never developed PCS noted that they had been give adequate post natal care, while atleast 04(50%) of those who developed sepsis citing that there was no adequate post-natal care extended to them, the study established that lackof adequate post nata care was a significant factor into leading to occurrence of sepsis, with an odds ratio of 4.60(1.51-17.25 and p-value of 0.001, post-natal care involves cleaning incision site, keeping personal hygiene and general good sanitation, when they are compromised, the patients becomes susceptible to bacterial inoculation that can lead to sepsis, when this study is compared with other studies, it shows a correlation with a study by [17] in which they showed that Most mothers in developing countries missed out on important medicine doses that would help them heal fast due unavailability of drugs at health centers and lack of money to meet the cost for basic care, Some mothers used herbs or took wrong prescriptions which did not heal their wounds in time which predisposed them to infections. The participants were assessed if health education had been done to them after the cesarean operation on how to care for the incision site, majority 5(62.5%) of those who got sepsis saidthey had not been given any health education while atleast 20(58.8%) of those who never developed sepsis said they had been health educated, the study established that lack of health education to post cesarean mothers was a contributing factor to occupancy of sepsis, at an odds ratio of 0.85(0.12-2.78) and p-value of 0.004, health education enables one to knowwhat to do in order to enable quick healing, some health workers barely have enough time to health educate patients or their care givers and therefore they can't take of incision site appropriately thus developing sepsis, when this study is compared with other studies, it shows a similarity with study by [18] in their study on the incidence and risk factors of post cesarean sepsis in a tertiary health institution in Kano, in which they reported that some of the cases with post cesarean sepsis was due to poor personal hygiene and negligence to follow the instructions given to them on discharge and that Standards of personal hygiene, such as bathing every day, were culture-dependent. Post cesarean mothers were assessed if they had received all the required drugs prescribed after their operation, majority of those who developed sepsis noted that they had not all the drugs because they were unavailable, while atleast 18(52.9%) of those who never developed sepsis said they had received their treatment, the study established that failure to receive the prescribed treatments after cesarean operation was a significant factor to occurrence of post cesarean sepsis with an odd ratio of 2.32(1.14-19.20 and a 0.002 p-value. Shortage of drugs could be because being a government public hospital, with a lot of patients, the drugs getused up before another batch of supply to the hospital, lack of key antibiotic drugs meant to prevent bacterial colonization at incision site, leads to wound infection and sepsis, when compared with other studies, this study shows a correlation from studies by [19] in a study on the timing of antibiotics at cesarean which revealed that, mothers who received antibiotics in time before and after operation had less chances of developing infections. Antibiotics given before operation helped to minimize the growth of pathogens around the surgical site which in the end led to serious infection and that most cases that was not done due to drug unavailability especially in public health care facilities in developing countries. The mothers were also asked if the health workers taking care of them were always available, the majority of both those 7(87.5%) who developed sepsis and those 24(70.6%) who never developed sepsis said the health workers were always available. The study established that availability of health workers at the hospital did not significantly affect the occurrence of sepsis among patients, health workers could have been available but if key drugs and other accessories to use on patient are not available, still sepsis would occur, when compared with others studies, [20]-[26] had also noted that, the amount of health care given to caesarean section mothers in health facilities further much determined their healing process and that good health care, the health workers had to periodically administer the necessary antibiotics or changes the course of treatment depended on the healing process of the wound, maintained theplaster at the wound site for about 48 hours that avoided invasion of foreign organisms, and advised on the feeding to ensure good immunity [27]. The cost of care was also assessed, and its impact on development of post cesarean sepsis, majority of both, those majority of both those 5(62.5%) who developed sepsis and those 22(64.7%), said the cost of care was high, and had become unaffordable, the study established that the cost of care did not significantly affect occurrence of post cesarean sepsis among mothers, at an odds ratio of 3.32(0.87-5.36 and a p-value of 0.063, this could be due to the cost of operation and other necessities required in pre andpost-operative arrangements, and after the operation if the patient runs bankrupt and cannot afford the cost of care, then she becomes susceptible to wound infection and sepsis, a comparative study by [21], [28]-[33] had reported that the cost of health care determined the times and amount of medication received by the patients and also that, in rural areas of Tanzania caesarean section mothers with low incomes could not afford private health care where they would be given adequate care. Another correlative study by [10] further noted that Private healthcare facilities wereknown to provide quality care to patients because of they were paid highly which enabled them to buy quality medicines and equipment.

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CONCLUSION

The study concludes that the study showed a high 19% sepsis occurrence, with those most affected being above 30 years and citing high cost of care as a contributing factor both at 62.5%.

RECOMMENDATION

All pregnant mothers attending ANC should be always screened for delivery complications so that they always be in hospital before having long hours of labor. The health workers preparing cesarean mothers pre and post-operative must ensure infection prevention maneuvers. The government should increase health care supplies, to make cost of health care affordable and accessible to everyone. The post cesarean mothers should be health education on the incision site care to prevent infection occurrence.

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