

Factors Influencing Puerperal Sepsis among Postpartum Women at Hoima Regional Referral Hospital, in Hoima District Western Uganda.

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ABSTRACT

The main objective of the study was to identify factors influencing puerperal sepsis among post-partum women at Hoima regional referral hospital, in Hoima district, Western Uganda. The specific objectives were; To determine the prevalence of puerperal sepsis at Hoima regional referral hospital, to assess the social demographic factors affecting puerperal sepsis at Hoima regional referral hospital, to determine Patients factors affecting puerperal sepsis at Hoima regional referral hospital and to determine the healthcare factors affecting the prevalence of puerperal sepsis at Hoima regional referral hospital. The study adopted the descriptive cross-sectional method. The study population was all mothers in the maternity ward of Hoima regional referral hospital who developed puerperal sepsis and consented to the study. The two sets of data; qualitative and quantitative data were analyzed separately using Microsoft Excel manually and interpreted into averages and percentages and presented on tables, graphs, and pie charts. It was found that the prevalence of puerperal sepsis was 37.5%, with most participants (51.7%) delivered by cesarean section, and 35.5% by spontaneous vaginal delivery. The study concluded that the majority of puerperal sepsis occurs due to poverty, low income, and low maternal age and that the caesarian section is a very high-risk factor. The study further recommended that the government through the Ministry of Health should partner with hospitals creating affordable costs for mothers whenever serious conditions arise. Also, the promotion of education of girl children to higher levels would reduce low maternal age and also directly reduce puerperal sepsis. Furthermore, healthcare workers should work in a skilled way to prevent sepsis in postpartum mothers.

Keywords: Puerperal sepsis, Mothers, Health care workers, Spontaneous vaginal delivery, Caesarian section.

INTRODUCTION

Puerperal sepsis is defined as an infection of the genital tract occurring at any time between the rupture of membranes or the onset of labor, and the 42nd day postpartum, in which a fever (temperature 38.5°C or higher) is present. This can be accompanied by one or more of the following signs and symptoms: Pelvic pain, abnormal vaginal discharge, e.g. presence of pus, abnormal smell/foul odor of discharge, sub-involution, i.e. delay in the rate of reduction of the size of the uterus (<2cm/day during the first 8 days) [1], [2].

Diagnosis, medical management, and antimicrobial therapy for sepsis have significantly advanced. Despite this, puerperal sepsis remains an important cause of maternal mortality accounting for 10.7% of all maternal deaths annually worldwide [3]. In 2010, puerperal sepsis alone caused at least 75,000 maternal deaths, mostly in low-income countries. Studies from high-income countries report the incidence of maternal morbidity due to sepsis of 0.1-0.6 per 1000 deliveries. The causative microorganisms are generally

polymicrobial with beta-hemolytic streptococci group A often being the cause of severe cases of puerperal fever. The single most important risk factor for postpartum infection seems to be a cesarean section, and prophylactic antibiotics during the procedure substantially reduce the infection risk [4], [5]. Improvements in service provision, as promoted through the Surviving Sepsis Campaign, can reduce the overall risk of mortality and morbidity from maternal sepsis in high-income as well as in low-income countries [6]. In developing countries, most of the risk factors for the development of puerperal sepsis exist and cases of puerperal sepsis have been reported. For example, in a Hospital in Johannesburg, South Africa, out of 272 women who delivered via Caesarean section, 4 (1.5%) were readmitted with puerperal sepsis, and 30 (11.0%) with possible mild wound infection [7] while in a rural Hospital in Sudan in 2012, the incidence of puerperal sepsis was found to be very high [8]. Out of 170 samples, 124 (72.9%) were pathogen-positive [8]. Another study was done in Tanzania with a sample size of 3,262 women who were selected and only 27% (877) claimed that the birth attendant inserted his /her hands in the vagina, and 25% (830) reported that the birth attendant first did hand washing before delivering her. Of those (830) women, 98% reported that the attendant used soap and water before inserting hands, while 1.5% were attended to by birth assistants who washed hands but developed puerperal sepsis compared to two (8.0%) of the 25 women who reported that the birth attendant did not wash their hands before inserting them into the vagina [9]. In Uganda, a study conducted in Mbarara Regional Referral Hospital in 2016, showed that maternal sepsis contributed the largest proportion of maternal mortality. Direct causes of mortality accounted for 77.7 % while indirect causes contributed 22.3 %. The most frequent cause of maternal mortality was puerperal sepsis (30.9 %) [10]. Over 70% of maternal deaths in developing countries are caused by puerperal sepsis among other causes including hemorrhage

culminating in anemia, hypertension, unsafe abortion, and obstructed labor [11]-[13]. The government of Uganda has enforced antenatal care (ANC) services. It has also collaborated with NGOs and partnerships with private Hospitals to offer service to all pregnant women so as to control infections and other complications after delivery but many mothers report back to health settings with puerperal sepsis. In Hoima regional referral Hospital, in Hoima District, Western Uganda, mothers tend to return to the Health facility a few days after delivery with complaints concerning different infections without proper origin which can, however, lead to morbidity and mortality. World Health Organization (WHO) recommends that pregnant women should have a written plan for births and for dealing with unexpected adverse events such as complications or emergencies that may occur during pregnancy, childbirth, or the immediate post-natal period, and should discuss and review this plan with a skilled attendant at each antenatal assessment and at least one month prior to the estimated date of delivery [14].

In Africa, retrospective studies estimate that puerperal sepsis causes nearly 10% of maternal deaths, a figure close to the world effect of puerperal sepsis on maternal mortality [10]. Maternal mortality is highest in sub-Saharan Africa. 86% of all maternal deaths occur in low and lower-middle-income countries [14]. In Uganda, the WHO- MDG 5 (aimed at reducing maternal mortality by 75 % between 1990 and 2015) was not attained despite the fact that the maternal mortality ratio (MMR) has improved from 550 per 100,000 in 1990 to 438 per 100,000 live births [10]. Further, there is limited data to show the factors and causes of maternal death due to puerperal sepsis in Uganda though available data ranks it as one of the leading causes of maternal death. It's upon this background statement that the researcher may wish to identify factors influencing puerperal sepsis among post-partum women at Hoima regional referral Hospital, in Hoima District, Western Uganda.

METHODOLOGY

Study Design

The study adopted the descriptive cross-sectional study to identify factors influencing puerperal sepsis among postpartum women at Hoima regional referral hospital, in Hoima district, Western Uganda. Qualitative and quantitative data collection methods were used. Survey questionnaires were provided to the diagnosed mothers.

Area of Study

The study was carried out at Hoima regional referral Hospital which is located in Western Uganda, Bunyoro subregion, in Hoima district and in Hoima City about 500M from Hoima central market and along Hoima-Kampala Road, about 200KM West of Kampala. Hoima district is bordered by Buliisa district to the North, Masindi district to the Northeast, Kyankwazi district in the East, Kibaale district to the South, Ntoroko district to the southwest, and the Democratic Republic of Congo across Lake Albert. The population census done in 2012 estimated the population of Hoima district to be about 548,800 people. The hospital caters to the populations of the greater Bunyoro region encasing the districts of Bunyoro overall grossing over 3 million people. The major economic activity in the district is Agriculture, but there is also fishing along Lake Albert.

Variables: dependent and independent

The prevalence of puerperal sepsis was the dependent variable while the factors influencing puerperal sepsis were the independent variable.

Study population

The study population was all mothers who delivered from Hoima regional referral hospital and develop puerperal sepsis.

Inclusion criteria

The inclusion criteria were all mothers in Hoima regional referral who developed puerperal sepsis and who consented.

Exclusion criteria

The exclusion criteria were all mothers in the postnatal ward who did not develop puerperal sepsis and those who did not consent.

Sample size determination

The sample size was determined using the formula below according to Fisher *et al.* [15].

$$n = z^2 \times p(1-p) / d^2$$

$$n = 1.96^2 \times 0.31(1-0.31) / 0.05^2$$

$$n = 1.92^2 \times 0.31 \times 0.69 / 0.0025$$

$$n = 1.92^2 \times 0.2139$$

$$n = 315.4$$

$$n = 315$$

Where:

n = minimum sample size required
 z = confidence level at 95% (standard value of 1.96)
 p = estimated prevalence puerperal sepsis (31% according to a study done by Ngozi *et al.* [10])
 d = margin of error at 5% (standard value of 0.05)

Sampling procedure

Hoima regional referral Hospital was selected (using purposive sampling) because it is the major health-providing facility in the Bunyoro subregion and a referral center to other neighboring health centers. The targeted participants were mothers in the post-natal ward of Hoima regional referral hospital with puerperal sepsis during the period of the study. A systemic sampling method using in-patient numbers was used to determine puerperal sepsis prevalence. To determine the patient and hospital factors, a questionnaire was given to selected patients using random sampling.

Data collection method and management

Data collection was done after obtaining permission from the district and the health center officials. Data collection, management, and analysis were done in a way to ascertain data quality, result reliability, and information accuracy. The research involved both qualitative and quantitative methods, open and close-ended well-structured questionnaires were given to individuals delivering from the hospital after their consent. There were interpreters for the participants who did not know English. The principal research supervisor crosschecked the filled questionnaires to ensure correctness and completeness.

Data analysis

The two sets of data; qualitative and quantitative data were analyzed separately using Microsoft Excel manually and interpreted into averages and percentages and presented on tables, graphs, and pie charts.

Quality control

The structured questionnaire was pretested on women giving birth from Hoima regional referral hospital, mistakes were identified and corrected. This was purposefully done to determine the suitability of the questions, relevance, validity, reliability, and completeness.

Prevalence of Puerperal Sepsis

Among all patients admitted to the maternity ward at the time of the study (1172 mothers), 440 mothers had puerperal sepsis.

Prevalence was calculated as;

Data presentation methods

The data obtained were presented in the form of charts, graphs, tables, and figures.

Ethical considerations

The research was conducted at Hoima regional referral hospital in Hoima district, after a recommendation from Kampala International University. The permission was sought first from the District Health Officer and the Hospital administration. Consent was sought from every participant after a thorough explanation of the procedures. Maximum confidentiality was maintained and a conducive environment was provided in order for the participants to provide truthful information.

RESULTS

= (Mothers that developed puerperal sepsis admitted in the maternity ward)/ (Total number of admissions) multiplied by 100
= $(440/1172) \times 100$
= 37.5%

Socio-demographics of the Respondents

Table 1: Socio-demographics of the respondents

Age	Frequency	Percentage
15-25	130	41.2%
26-35	88	27.9%
36-45	80	25.4%
46 and above	17	5.4%
Total	315	100
Level Of Income		
Above the poverty line (0.88\$ per day)	65	20.7%
Below the poverty line (0.88\$ per day)	250	79.3%
Total	315	100
Occupation		
Peasants	150	48%
Teachers	25	8%
Unemployed	100	32%
Traders	30	9%
Others	10	3%
Total	315	100%
Level of Education		
Primary	130	41.2%
Secondary	88	27.9%
College	80	25.4%
Others	17	5.4%
Total	315	100

Most of the participants were between the age of 15-25 (41.2%) followed by those of

26-35(27.9%) while 46 and above was the least (5.4%) Most of the respondents were

poor (79.3%) compared to 20.7% who were above the poverty line for Uganda. Most patients with puerperal sepsis were peasants (48%) followed by the unemployed (32%), while traders were 9%, teachers 8% and others accounted for 3%.

For the case of education level, most of the respondents had a primary level (41.2%), (27.9%) had a secondary level, (25%) had attained a college level and (5.4%) had other qualifications.

Table 2: The patient factors affecting puerperal sepsis at Hoima regional referral hospital.

OBSTETRICS DATA	Frequency	Percentage
How many deliveries have you had before?		
1	122	38.7
2	61	19.4
3	74	23.5
4 and more	58	18.4
TOTAL	315	100
Where did you deliver from?		
Health Center facility	189	60
Home	126	40
Total	315	100
By what mode of delivery was your last delivery?		
Spontaneous vaginal delivery	112	35.5
Cesarean section	163	51.7
Others	40	12.7
Total	315	100
Were you assisted during delivery?		
Yes	221	70
No	94	30
Total	315	100
If yes, who assisted you?		
Doctor	91	41.2
Mid wife/ Nurse	130	58.8
Total	221	100

The majority (38.7%) of respondents had single deliveries before, 23.5% had three, 19.4% had 3, and 18.4% had 4 and more. Most participants (60%) delivered from the health Centre while 40% delivered from home. Most participants (51.7%) delivered by cesarean section, 35.5% by spontaneous

vaginal delivery while 12.7% delivered by other means. Of all patients interviewed, 70% were assisted during delivery while 30% were not. The majority (58.8%) were assisted by the midwife/ Nurse while the rest (41.2%) were assisted by the doctor.

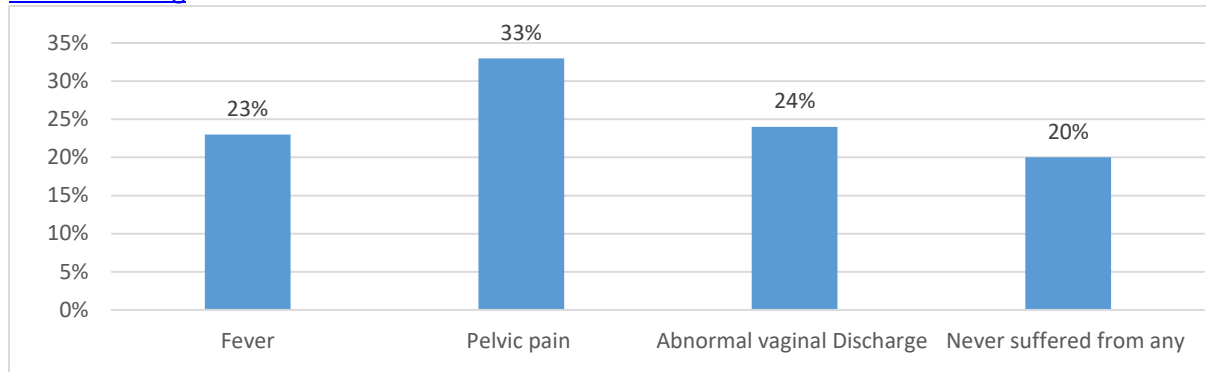


Figure 1: Signs that participants have observed having developed

The majority of participants developed pelvic pain (33%), (24%) got an abnormal vaginal discharge, (23%) observed having

fever while (20%) never suffered from any of the mentioned signs.

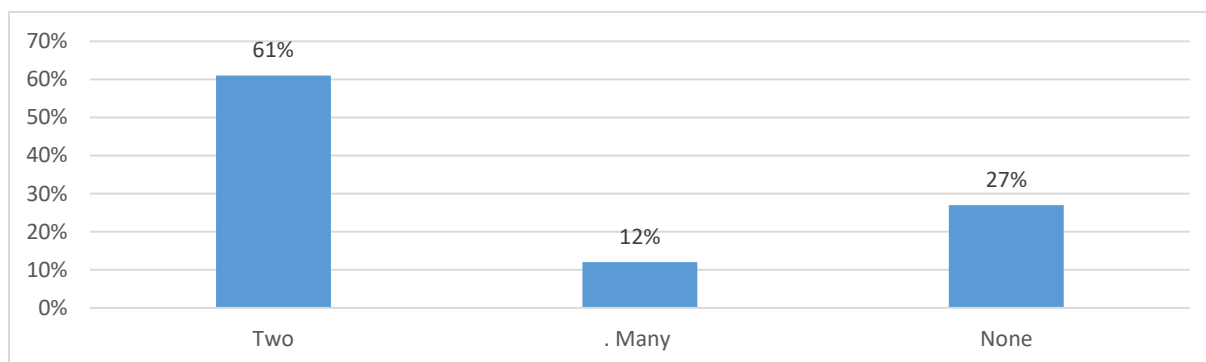


Figure 2: Vaginal examinations assistants did

It was found that the majority of participants 61% were examined only two

times while 12% were examined many times which they did not even remember.

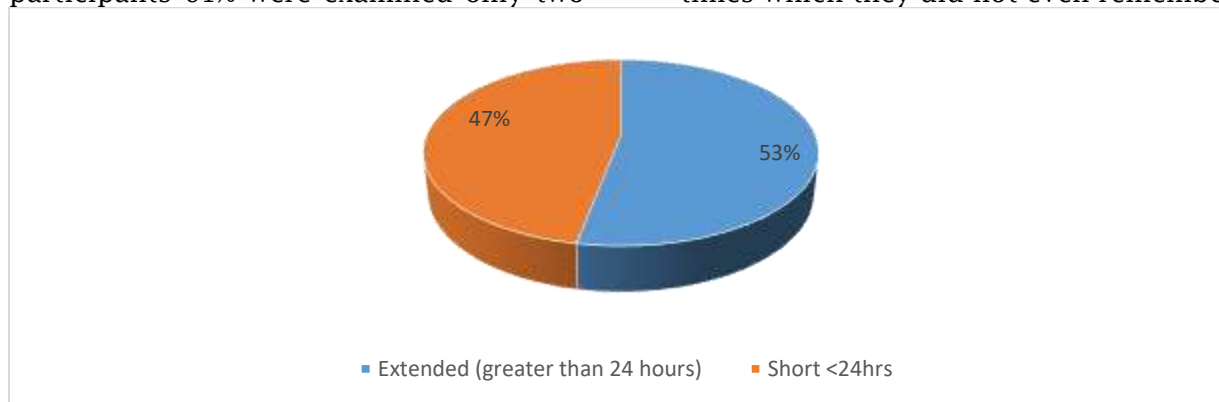


Figure 3: Period lasted in labor

Most participants (53%) revealed that their labor was extended (greater than 24 hours) while few (47%) had their labor within 24 hours.

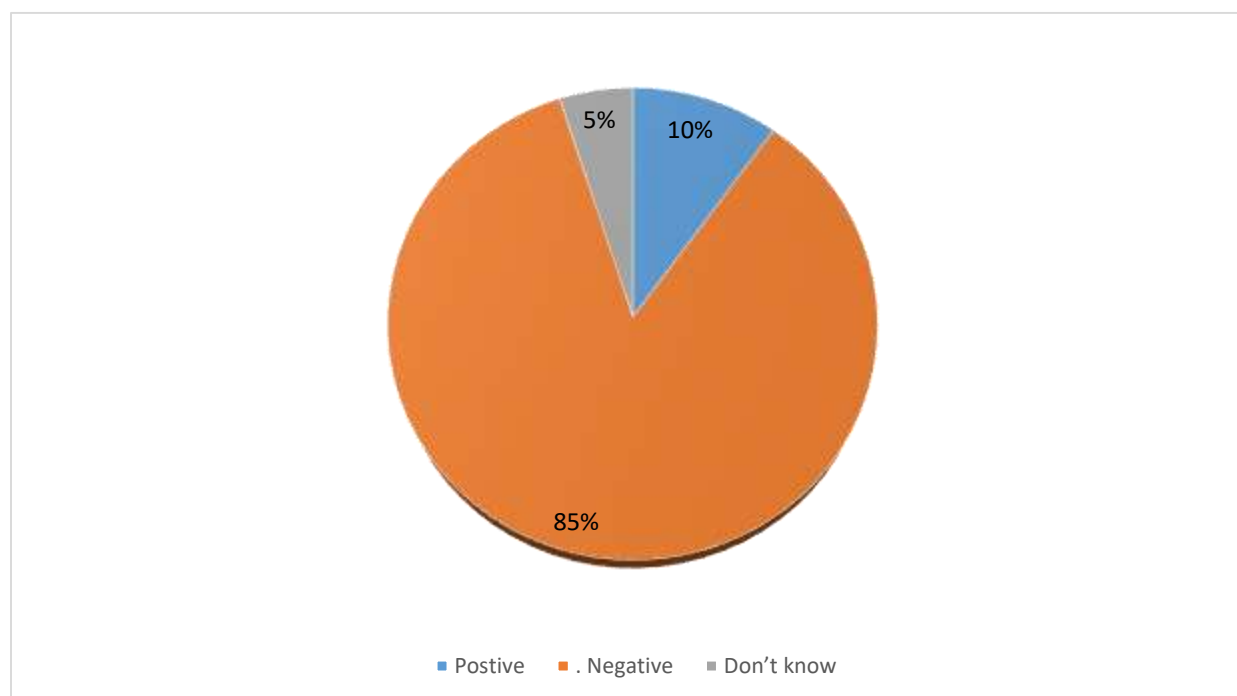


Figure 4: HIV/AIDS status

From the findings majority (85%) tested negative for HIV/AIDS, 10% were positive while (5%) did not know.

DISCUSSIONS

The prevalence of puerperal sepsis was found to be 37.5% which is above that established by research done by [10]. This means that the burden of the disease is high as compared to that in Mbarara regional referral hospital and Mulago national referral. This difference by region could be due to poor services in Hoima as compared to the latter. Most of the participants were between the age of 15-25 (41.2%) followed by those of 26-35 (27.9%) while 25.4% were between 36-45 and 46 and above were the least (5.4%). The findings were in agreement with another study done by [16] where women between 15-45 years were the most affected but somehow disagreed with the study done in Pakistan which revealed that puerperal sepsis was highly reported in women above 31 years of age [6]. Younger women were a risk factor in this study probably due to a lack of knowledge and experience in birth hygiene. Most of the respondents were poor (79.3%) compared to 20.7% who were above the poverty line in Uganda and

this was in agreement with another study by [17]. Most patients with puerperal sepsis were peasants (48%) followed by the unemployed (32%), while traders were 9%, teachers 8%, and others accounted for 3%. This relates to the level of income as less income possibly makes women unable to access clean items and practices but could also cause poor nutrition and hence reduce the immunity of the mother. For the case of education level, most of the respondents had a primary level (41.2%), 27.9% had a secondary level, (25%) had attained a college level and (5.4%) had other qualifications. Most participants (60%) deliver from health centers, unlike the least 40% who delivered from the hospital. This disagreed with a study done in Bangladesh by [18]. It may be that healthcare factors are the most cause of puerperal sepsis but it could also be that most people who delivered from home never access healthcare due to poverty. Most participants (51.7%) delivered by Cesarean section compared to (35.5%) who

delivered by spontaneous vaginal delivery. Of all patients interviewed, 70% were assisted during delivery while 30% were not. This points more to the part played by hospital factors still to the development of the infection. The majority (58.8%) were assisted by the midwife/ Nurse while the rest (41.2%) were assisted by the doctor which could mean that there are poor skilled nurses compared to doctors or because nurses were more available to examine many patients compared to doctors. These were in agreement with the study done by [19] at Kampala international university teaching hospital, 50% of mothers who developed sepsis had many vaginal exams compared to those who had few examinations [19]- [23]. Participants had revealed that they extended (greater than 24 hours) in labor unlike a few (47%) who took on within 24 hours. Some doctors in an interview revealed that the average labor lasts 12 to 24 hours for a first birth and is typically shorter (eight to 10 hours) for other births. Throughout this time, the woman will experience three stages of labor. The first stage of labor is usually the longest and it ranges from when labor first sets in until the cervix is open. The findings implied

The study revealed that the majority of puerperal sepsis occurs during natal and postnatal periods in general. Rural residence, Educational level of a primary or less, monthly income of mother or family ≤ 0.88 US DOLLARS per day, being in labor for > 24 h, delivered by cesarean section, low maternal age, and prime

CONCLUSIONS

Andrew that the majority of participants had more than one delivery. It was found that the majority of participants 61% were examined only two times while 12% were examined many times which they did not even remember. The majority of women (61%) were examined 2 times, 27% were never examined and 12 were examined many times. This was in disagreement with a study by [19], [24]-[29] where most of the patients had many vaginal examinations. Most patients had their labor extended more than 24 hours (53%) and 47% had shorter labor duration. This was in agreement with another study done by [10], who explained that delay in labor increases the chances of bacteria ascending into the female genital tract and causing infection. Out of the total number, patients who were HIV-positive were 10%, 5% didn't know their HIV status and most (85%) were HIV-negative. HIV infection dampens the patient's immune system thereby increasing the risk of speedy emergence of other diseases culminating in high maternal mortality and morbidity [20], [30]-[32]. Thus, early screening is needed to prevent mother-to-child transmission and to also improve maternal health.

parity, assisted by nurse compared to assisted by a doctor, were identified determinants of puerperal sepsis. Employing more doctors, scaling up the educational level of the community, and supporting those of low socioeconomic status were recommended interventions.

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