

Incidence of Neonatal Septicemia in Babies Admitted in Pediatric Ward of KIU-Teaching Hospital, Ishaka Uganda.

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ABSTRACT

This research was done to determine factors that influence the occurrence of neonatal septicemia among babies admitted in Kampala international university teaching hospital. This study was guided by the following objectives: to assess the maternal related factors associated with occurrence of neonatal septicemia among babies admitted in Pediatric ward of Kampala international university teaching hospital; to determine neonatal related factors associated with occurrence of neonatal septicemia among babies admitted in Pediatric ward of Kampala international university teaching hospital and to determine the social-economic factors associated with occurrence of neonatal septicemia among babies admitted in Pediatric ward of Kampala international university teaching hospital. A cross sectional study design was used in this study; A sample of 134 respondents were studied which included neonates/caretakers and health workers; data was collected with the use of observation, interview guide and questionnaires; data analysis and interpretation were done using Statistical package for social sciences (SPSS) to generate descriptive statistics and Chi-square p-values that were used to draw conclusion of the study. The results from this research showed that; - the maternal factors that influenced the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital were inadequate Antenatal Care (ANC) attendance, prolonged rupture of membrane, bathing neonates with herbal medicines and place of delivery whereby a significant number of mothers delivered from home. On the neonatal factors the researcher found out that birth weight had a significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. Finally, the study identified the socio-economic factors responsible for the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital as washing hands before handling the neonates, low level of monthly household income and low level of education among caretakers. Based on the findings of this study, the researcher recommends that the Government through the DHOs offices should embark on health education by educating the pregnant women on the dangers of giving birth from their homes and also being helped by unqualified midwives. Also, the government through district sensitization programs should encourage pregnant women to seek antenatal care at the health facilities where they can be health educated, comprehensively screened and treated of infections to prevent spread of infections to newborns.

Keywords: Pediatric, Septicemia, Pregnant Women, Health Education, Antenatal care.

INTRODUCTION

The aim of this study is to determine the factors associated with neonatal Septicemia among Babies admitted in Kampala international University teaching

hospital. Neonatal septicemia refers to generalized bacterial infection documented by a positive blood culture in the first 28 days of life [1]. Neonatal

septicemia is a major cause of newborn deaths worldwide and one of the main factors that contribute to high neonatal mortality rates. Neonatal septicemia accounts for five million newborn deaths, and is mostly diagnosed in underdeveloped countries or in developing countries. Neonatal septicemia infection may occur at an early stage, during the first 48 hours of life, and after this period it is characterized as a late onset, usually caused by contact with pathogens acquired after birth [2]. Globally, the incidence of neonatal septicemia in developed countries of Europe and North America ranges between 0.95/1000 live birth to 3/1000 live birth [3]. World Health Organization (WHO) reported that septicemia, pneumonia and tetanus account for 85% of newborn mortality, 40% of newborns identified with septicemia die before their first birth day and the highest rate comes from low-income states [4].

Unlike the values reported from developed countries, the reports from Nigeria like other developing countries are higher, ranging from 5.5/1000 live births to 35/1000 live births [5]. The most affected subjects are low-birth weight infants subjected to invasive procedures during their hospitalization in the Neonatal Intensive Care Unit (NICU) (Report of the national neonatal perinatal database, National neonatology forum 2012-2013). The gold standard for diagnosis of neonatal septicemia is isolation of causal bacterial agent from a blood sample [5][6]. In Africa, about forty percent of under-five deaths occur in the neonatal period resulting in 2.9 million newborn deaths each year [7]. The highest mortality rates for newborns are found in the poorest countries and a third of these deaths are attributed to infections acquired by the baby during labour and delivery or after birth [7]. In [8], the author further reported that, 4 million neonatal deaths are estimated to occur worldwide with highest reported cases from Sub Saharan Africa. In Nigeria, mortality rates from neonatal septicemia have ranged from 26.7% in Abakaliki, to 32.2% in Sagamu and 33.3% in Ile-Ife, over

Kahuma the last two decades [9]10-14]. In East Africa, Uganda accounts for highest number of neonatal deaths in East Africa and third in the Africa (after Nigeria and Zimbabwe) with septicemia responsible for about 30% to 50% of deaths [10]. Also in Uganda, the prevalence of neonatal septicemia reported from previous hospital-based studies ranges between 7.04 and 22.9 per 1 000 live births. A survey done in Mulago National Referral Hospital in Uganda in 2012 showed that neonatal septicemia was the most common cause of admission to the neonatal ward [11] [15-18]. Most of these neonates were born in health facilities and discharged home, only to return to hospital with symptoms of neonatal septicemia. This finding suggests that there are unexplained risk factors not only in the health facilities but also in the communities to which these neonates are discharged.

Statement of the problem

In Uganda 29% of 4.2 million deaths of children under five are neonates [12][19]; in the effort to combat this alarming death rate, Ministry of health of Uganda in cooperation with World Health Organization (WHO) have put forth a set of evidence based neonatal health interventions called the essential newborn care (ENC) practices which include clean delivery, cord care, skin and eye care, early and exclusive breast feeding, thermal protection, and immunization [4]. These interventions have been widely emphasized in policy and rolled out in Uganda. In this context, Kampala International University-Teaching Hospital has got better accessibility to health services and higher rates of antenatal care (ANC) attendance (78%); gives health education to mothers and reports more deliveries under skilled supervision [13] [20-23].

Aim of the study

To establish factors influencing the occurrence of neonatal septicemia among babies admitted in Kampala international university teaching hospital.

Specific objectives

- To assess the maternal related factors associated with

- occurrence of neonatal septicemia among babies admitted in Pediatric ward of Kampala international university teaching hospital.
- To determine neonatal related factors associated with occurrence of neonatal septicemia among babies admitted in Pediatric ward of Kampala international university teaching hospital.
 - To determine the social-economic factors associated with occurrence of neonatal septicemia among babies admitted in Pediatric ward of Kampala international university teaching hospital

Research questions

- i. What maternal related factors are associated with occurrence of neonatal septicemia among babies admitted in Pediatric ward of Kampala international university teaching hospital?
- ii. Which neonatal related factors are associated with neonatal septicemia among babies admitted in Pediatric ward of Kampala international university teaching hospital?

- iii. What socio-economic factors are associated with neonatal septicemia among babies admitted in Pediatric ward of Kampala international university teaching hospital?

Justification of the study

The findings of the study might help other researchers intending to conduct related studies by adding on the existing literature on neonatal septicemia among babies. This survey was also timely in adding insights into existing literature and addressing the knowledge gaps on factors that influence the occurrence of neonatal septicemia among babies. Creation of this knowledge involves a social science discipline working together with the medical profession and yet, this important area of social sciences in neonates' health care has not been adequately developed; therefore, information garnered from this research may be utilized in designing interventional Programs that may help the communities and the government in prevention of neonatal septicemia among babies. Lastly to the researcher, the study was to help him to fulfill the requirements for the award of Degree of Bachelor in Medicine and Surgery of Kampala International University.

METHODOLOGY

Study area

The study was conducted at Kampala international university teaching hospital located in Ishaka town in Bushenyi District; about 325 kilometers south west of Kampala the capital city of Uganda.

Study design

A cross sectional study design was used to assess the factors associated with neonatal septicemia among babies admitted in pediatric ward in Kampala international university teaching hospital. The Cross-sectional study design was used because it enables a researcher to collect data at a given period of time as reflected by the general situation in the hospital. Both Quantitative and qualitative data collection approaches were used to collect data.

Study population

The target population comprised of neonates admitted at pediatric ward of Kampala international university teaching hospital with signs and symptoms of neonatal septicemia during the period. In this case, Pediatric ward of KIU-TH received 219 neonates with neonatal septicemia confirmed in the period of study. The researcher also involved 4 health workers at the pediatric ward who were the key informants.

Sample size determination

A sample refers to the proportion of the population [14]. The researcher used Slovin's (1960) formula of sampling that states as;

$$n = \frac{N}{1 + N(e^2)}$$

Where n= sample size

N= population

e=standard error

n=131 in this case therefore; the researcher studied a sample of 131 neonates/caretakers.

Table 1: Distribution of the respondents

Category	Frequency	Sampling technique
Neonates/caretakers	131	Simple random sampling
Health workers/Key informants	3	Purposive sampling

Sources of data

The major sources of data was neonates who were admitted in the pediatric ward of Kampala international hospital and the hospital administrators and health workers in the Pediatric ward of KIU-TH.

Sampling procedure

Cases of babies with septicemia were identified with use of laboratory results. All caretakers of selected babies admitted in the pediatric ward of Kampala international university teaching Hospital with cases of septicemia in particular were engaged in answering the questionnaire; and these were selected with use of random sampling. All health workers in the Pediatric ward of KIU-TH were purposively selected into the sample.

Data collection tools

The tools for data collection that were used during the study include questionnaires, observation checklist and a key informant interview guide.

Data collection techniques

This constitutes methods that were applied to achieve the research exercise, this include;

Self-administered questionnaire

Care takers in the Pediatric ward at KIU-TH were given questionnaires to fill.

Observation

The researcher observed the neonates who were admitted in the pediatric ward of Kampala international university teaching hospital and general hospital environment. He also observed the

laboratory results checking for neonates with and without neonatal Septicemia.

Interviewing

Interviews were held with the participants with the health workers in Pediatric ward as key informants using key informant interview guide.

Data analysis procedure

Statistical Package for Social Sciences version 17.0 was used for data entering and analysis. Descriptive statistics and Statistical analysis (Chi-square test) of the data were obtained by using SPSS ver. 17 software and the P-value was determined which helped the researcher to discuss the findings and draw conclusions in this study.

Quality control issues

The data collection tools were pre-tested on a smaller number of respondents from in Kampala international teaching Hospital to ensure that the questions were accurate and clear in line with each objective of the study thus ensuring validity and reliability.

Ethical Considerations

- ❖ All information was treated with confidentiality and actual names of the clients were not written on the forms.
- ❖ Approval was sought from KIU Teaching Hospital-Ethics and Research Committee.
- ❖ Permission was first sought from participants and the in-charge of Pediatric ward KIU-TH.

RESULTS

Background Information

Table .2: the table showing the descriptive statistics of background information of the caretakers to the neonates with neonatal septicemia admitted at KIU-TH

Characteristic	Frequency	Percentage
Sex		
Female	126	96.4%
Male	05	3.6%
Age group		
19-34 years	19	14.5%
35-44 years	86	65.6%
45-54 years	12	9.2%
55-64 years	14	10.7%
Marital status		
Single	19	14.5%
Married	95	72.5%
Separated	6	4.6%
Widow/Widower	11	8.4%
Level of education		
None	9	6.9%
Primary	65	49.6%
High school	28	21.4%
Tertiary	29	22.1%
Monthly income		
Less than Ugsh 250,000	78	59.5%
Less than Ugsh 400,000	25	19.1%
Less than Ugsh 500,000	13	9.9%
Less than Ugsh 800,000	5	3.8%
Less than Ugsh 1,000,000	6	4.6%
Ugsh 1,000,000 or more	4	3.1%
Distance to the HC		
Very close	46	35.1%
Close	34	26.0%
Far	34	26.0%
Very far	17	13.0%
Knowledge on bacterial infection		
Yes	86	65.6%
No	45	34.4%

From the results in Table 2 above, the background information of the caretakers that were looked at include; sex, age group, marital status, level of education, financial status and the distance to the health center. These were interpreted below as follows;

On sex of the respondents; most of the respondents (96.4%) were female and 3.6% of the respondents were male. On the age group distribution of the respondents; 65.6% were in the age group of 35-44 years, 14.5% were in the age group of 19-34 years, 10.7% were in the age group of

55-64 years, and finally 4.9% were in the age group of 45-54 years. On the marital status of the respondents; most of the respondents (72.5%) were married, 14.5% were single, 4.6% were separated, and finally 8.4% were widows/widowers. On the level of education; Most of the respondents (49.6%) were at primary level, 22.1% were of tertiary level, 21.4% were of high school level and finally 6.9% had not attained any formal education. On Monthly income of the respondents; Most of the respondents (59.5%) were earning less than Ugsh 250,000, 19.1% were

earning less than less than Ugsh 400,000, 9.9% were earning less than Ugsh 500,000, 4.6% were earning less than 800,000, 3.8% were earning less than Ugsh 1,000,000, and finally only 3.1% were earning Ugsh 1,000,000 and more. On the distance to the health center; 35.1% were staying very

close, 26% were staying close, 26% were staying far, and finally 13% were staying very far from the health center. Finally on the knowledge about bacterial infection among babies, 65.6% had knowledge on bacterial infection and 34.4% did not have knowledge about it.

Table 3: Maternal factors in relation to occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital.

Characteristic	Response	Frequency	Percentage	Chi-square	P-value
Maternal age	<20 years	8	6.1%	2.485	0.485
	20-29 years	51	38.9%		
	30-39 years	69	52.7%		
	>40 years	3	2.3%		
Place of delivery	Hospital	76	58.0%	6.584	0.010*
	Health center	16	12.2%		
	Home	39	29.8%		
Mode of delivery	Caesarian section	51	38.9%	4.841	0.096
	Vaginal Delivery	80	61.1%		
ANC attendance	<4 times	97	74.0%	9.321	0.000*
	>=4 times	34	26.0%		
Bathe baby with herbal medicine	Yes	122	93.1%	7.213	0.032*
	No	9	6.9%		

P-value<0.05 is considered statistically significant

The results in the table above showed that most of the mothers of the infected neonates (52.7%) were in the age group of 30-39 years; 38.9% were in the age group of 20-29 years; 6.1% were less than 20years of age; and 2.3% were >40 years. P-value=0.485>0.05 shows that maternal age had no significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital.

Most of the mothers of the neonates (58%) were delivered from the hospitals; 12.2% delivered from health Centers and finally 29.8% delivered from home. P-value=0.010<0.05 shows that place of birth had a significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. Most of the respondents (61.1%) delivered by vaginal delivery and 38.9%

delivered by caesarian section. P-value=0.096<0.05 shows that mode of delivery had no significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. Most of the respondents (74%) had attended ANC less than four times and 26% had attended more than 4 times. P-value=0.000<0.05 shows that ANC attendance had a significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. Most of the respondents (93.1%) bathed the neonates with herbal medicine and 6.9% were not bathing their neonates with herbal medicines. P-value=0.000<0.05 shows that ANC attendance had a significant influence on the occurrence of neonatal septicemia among babies

admitted in pediatric ward of Kampala international university teaching hospital.

Results from the key informants; -

- Key informant 1 responded that “some people still trust the local midwives and they produce from home with their help; some don’t attend Antenatal Care(ANC) often to check if there are any preventable problems and also to get medical education”

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- Key Informant 2 responded that “neonatal septicemia was as a result of maternal risk factors such as fever and prolonged rupture of membrane”
- Key informant 3 responded that “the occurrence of neonatal septicemia was due to poor hygiene of the care takers, ignorance and failure to attend ANC in time”

Table 4: The neonatal factors in relation to the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital.

Characteristic	Response	Frequency	Percentage	Chi-square	P-value
Weight at birth	1500 - 2499g (LBW)	48	36.6%	13.624	0.000*
	2500 - 4000g (Normal)	72	55.0%		
	>4000 (Overweight)	11	8.4%		
Immunization	Yes	131	100.0%	1.669	0.916
	No	0	0.0%		
Breast feeding	Yes	131	100.0%	8.96	0.255
	No	0	0.0%		
Sex	Male	56	42.7%	6.236	0.182
	Female	75	57.3%		
Excessive crying	Yes	47	35.9%	5.801	0.279
	No	84	64.1%		

P-value<0.05 is considered statistically significant

Results in the table above showed that; - 55% of the neonates were born with a normal weight; 36.6% were born with a low birth weight and 8.4% were born with an overweight. P-value=0.000<0.05 shows that weight at birth had a significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. 100% of the neonates were immunized; P-value=0.916>0.05 shows that immunization had no significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. 100% of the neonates were breast feeding; P-value=0.255>0.05 shows that breast feeding of the neonates had no significant

influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. 57.3% of the neonates were females and 42.7% were males; P-value=0.182>0.05 shows that sex of the neonates had no significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. 64.1% of the neonates were not excessively crying and 35.9% were excessively crying. P-value=0.279>0.05 shows that excessive crying of the neonates had no significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital.

Table 5: The social-economic factors in relation to the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital.

Characteristic	Response	Frequency	Percentage	Chi-square	P-value
Bathed baby within 24hours	Once	0	0.0%	3.88	0.275
	Twice	45	34.4%		
	More than twice	86	65.6%		
Number times the cord is cleaned in the day	None	0	0.0%	4.585	0.205
	Once	21	16.0%		
	More than once	110	84.0%		
Washing of hands prior to handling the baby	Yes	40	30.5%	8.47	0.037*
	No	91	69.5%		
Level of household monthly income	Less than 250,000 (low)	78	59.5%	12.168	0.016*
	250,000-500,000 (moderate)	38	29.0%		
	More than 500,000 (affording)	15	11.5%		
Source of water used	Tap	49	37.4%	2.38	0.497
	Spring	22	16.8%		
	Bore hole	7	5.3%		
	Well	53	40.5%		
Level of education	None	9	6.9%	8.148	0.043*
	Primary	65	49.6%		
	High school	28	21.4%		
	Tertiary	29	22.1%		

P-value<0.05 is considered statistically significant

Results in the table above showed that; 34.4% of the neonates were bathed twice a day; 65.6% were bathed more than twice and none was bathed once. P-value=0.275>0.05 shows that number of times the neonates was bathed had no significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. 84% of respondents responded that the neonates' cords were cleaned more than once a day; 21% responded that they were cleaned once a day. P-value=0.205>0.05 shows that number of times the neonates cord was cleaned per day had no significant influence on the occurrence of

neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. 69.5% of the respondents responded they were not washing hands prior to handling the neonates; 30.5% responded that they were washing the hands. P-value=0.037<0.05 shows that washing hands prior to handling the baby had a significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. 59.5% of the care takers responded that their monthly household income was low (less than 250,000); 29% had a moderate monthly house hold income (250,000-

500,000); only 11.5 had a monthly household income greater than 500,000= . P-value=0.016<0.05 shows that monthly household income had a significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. 40.5% of the respondents were fetching water from the well; 37.3% from the tap; 16.8% from the spring and 5.3% from the bore hole. P-value=0.497>0.05 shows that the source of water used had no significant influence on the occurrence of neonatal septicemia

among babies admitted in pediatric ward of Kampala international university teaching hospital.

49.6% of the caretakers of the neonates were for primary level; 22.1% were for tertiary level; 21.4 were for high school level; and 6.9% had not gone to school. P-value=0.043<0.05 shows that education level of the caretaker had a significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital.

DISCUSSION

Maternal factors responsible for the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital were inadequate ANC attendance, prolonged rupture of membrane, bathing neonates with herbal medicines and place of delivery where by a significant number of mothers delivered from home. These findings were in line with [15], who found out that lack of attendance of antenatal care was significantly associated with neonatal septicemia among babies admitted in Mulago hospital. Also in the study that sought to investigate the relationship between interval of membrane rupture and risk of neonatal septicemia, findings showed that the probability of neonatal septicemia increases independently and linearly with duration of membrane rupture up to 36 hours with 1.29 times more chance per 6 hours increase in membrane rupture duration before onset of labor [16][24-8] On the neonatal factors the researcher found out that birth weight had a significant influence on the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital. This was in agreement with [17]in study

that sought to examine risk factors for neonatal septicemia and perinatal death among infants enrolled on the prevention of prenatal sepsis trial in Soweto, South Africa and found out that low birth weight, first birth, emergency caesarean section and male sex were significantly associated with late or early onset of septicemia [29-32]. Also, [11] added that low birth weight is associated with an increased risk of neonatal septicemia among neonates.

Finally, the study identified the socio-economic factors responsible for the occurrence of neonatal septicemia among babies admitted in pediatric ward of Kampala international university teaching hospital as washing hands before handling the neonates, low level of monthly household income and low level of education among caretakers. This was in agreement with [9] in one study from South-Western Nigeria that found out that common risk factors were lack of good obstetric care, poor nursery practices, low socio-economic status, poor housing conditions, poor personal hygiene, delivery at home/unhygienic environment, prematurity and complications of labor, and most of these are preventable.

CONCLUSION

There were high number admissions of neonatal septicemia neonates among babies in pediatric ward of Kampala international university teaching hospital. The factors responsible for the occurrence of neonatal septicemia among babies identified in the study included; -

Inadequate ANC visits, prolonged rupture of membrane, bathing neonates with herbal medicines, giving birth from homes, low birth weight, low level of monthly household income and the low level of caretakers' education.

Recommendations

Basing on the findings of the study, the researcher recommended the following:-

- The Government through the DHOs offices should embark on health education by educating the pregnant women on the dangers of giving birth from their homes and also being helped by unqualified midwives.
- The researcher also recommended that neonates should always be handled in clean clothing or with washed hands to prevent the spread of bacteria which could cause neonatal septicemia.
- The researcher recommended that mothers/care takers should always bath the neonates with clean water preferably boiled water to prevent the spread of bacteria which could cause neonatal septicemia.
- Finally, the researcher recommended that pregnant women should always be fed well on all deities to reduce the persistent challenge of low birth weight among babies.

- The government through district sensitization programs should encourage pregnant women to seek antenatal care at the health facilities where they can be health educated, comprehensively screened and treated for infections to prevent spread of infections to newborns.
- Mothers should also be encouraged to continue exclusive breastfeeding of sick newborns however alternative clean feeding practices for newborns should also be taught to mothers.
- Supply of antibiotics and medical sundries should also be strengthened so that health workers can sufficiently control septicemia within alsl the health facility.

Areas for further studies:

The researcher suggested that other researchers may do research on the following;

- ✓ The prevalence of neonatal septicemia in Bushenyi district.
- ✓ The prevention and treatment measures and of neonatal septicemia among neonates.

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