

Incidence and Correlates of Preterm Birth at Hoima Regional Referral Hospital

Ssali Ronald

Department of Medicine and Surgery, Kampala International University, Uganda

ABSTRACT

Born before completing 37 weeks of gestation or 259 days from the first day of a woman's last menstrual period, preterm birth, as per WHO, is the leading cause of infant mortality globally. In 2013, it accounted for 1 million out of 6.3 million deaths among children under 5. While predominantly affecting developing nations, its impact extends worldwide, influencing maternal health and the survival challenges faced by premature infants. An investigation aimed to discern the prevalence of preterm birth and its associated factors at HRRH was conducted. This cross-sectional, institution-based study assessed mothers delivering newborns at HRRH from March 1st to 31st, 2021. A sample of 60 mothers was selected using simple sampling techniques. Face-to-face interviews with structured questionnaires gathered data, which was coded, organized manually, and analyzed using SPSS for descriptive parameters. The study revealed a 33% prevalence rate of preterm birth. Risk factors identified included a history of preterm labor ($P=1.00$), premature rupture of membranes ($P<0.001$), urinary tract infection during pregnancy ($P=0.01$), hypertension during pregnancy ($P=0.836$), history of malaria during pregnancy ($P=0.003$), and infant gender ($P=0.144$). Recognizing pregnant women at risk of preterm delivery and enhancing healthcare quality, community health education, and awareness campaigns are crucial steps to mitigate the incidence and consequences of preterm birth. Moreover, further research with larger sample sizes is warranted to explore additional associations leading to preterm birth.

Keywords: prevalence, risk factors, preterm birth

INTRODUCTION

Preterm birth is one of the major public health concerns worldwide. It continues to be the leading cause of perinatal and postnatal mortality especially in developing countries, where health facilities are not only limited but are not functioning properly [1].

In spite of our knowledge about the problem in Uganda preterm birth is one of the commonest causes of child health problems, implicating adverse consequences for not only individuals but also their families, health agencies, facilities and societies [2, 3, 4].

Babies born prematurely but who survive the immediate postnatal period have an increased risk of death and morbidity during childhood as well as delay in both growth and development compared to

babies born at term. Newborns are perhaps the most vulnerable population the world over [5, 6].

In Uganda, 226,000 babies are born too soon each year and 12,500 children under five die due to direct preterm complications [7, 8, 9].

Uganda together with other selected East African countries joined in the Preterm Birth Initiative (PTBi) East Africa, which is an initiative funded by the Bill and Melinda Gates Foundation working to reduce the burden of prematurity. Working in selected sites in Kenya, Uganda, and Rwanda, PTBi-East Africa aims to reduce morbidity and mortality from preterm birth by strengthening facility-based care from pregnancy through labour, delivery, and immediate

postnatal period. In Uganda, the overall goal is to reduce neonatal mortality and morbidity due to prematurity.

Study Design

It was a cross sectional study [8].

Study Area

Hoima Regional Referral Hospital (HRRH) is located in Hoima, a city in Hoima District, in the Bunyoro sub-region in the western region of Uganda, It is approximately 200kilometres (124miles) by road from the North West of Kampala, The coordinates of Hoima City are 1025'55.0"N 31021'09.0"E (Latitude: 1.431944; Longitude: 31.352500). It has a population of around 100,099 people [9].

Study Population

All mothers with newborns.

Inclusion criteria

The study was carried out among mothers within HRRH with newborns who are not older than 24hrs admitted in kangaroo unit

Exclusion criteria

All mothers in HRRH with newborns older than 24hrs.

All mothers with newborns who are less than 24hrs but did not give consent.

Sample Size determination

A sample was determined using Kish Leslie (1965), formula below:

$$n = \frac{Z^2 P(1 - P)}{D^2}$$

Where n= was the Desired sample size

Z= Standard normal deviation taken as 1.96 at a confidence level of 95%

A total of 60 mothers who delivered at Hoima Regional Referral Hospital (2021) were interviewed and their gestation age at delivery was recorded. Among all mothers, 20 (33%) has pre-term birth while 40 (67%) had births to term [Figure

In this study, a cross section study will be used to determine prevalence and factors associated with preterm birth in Hoima regional referral hospital.

METHODOLOGY

P= Proportion of target population estimated to have similar characteristics
Therefore;

$$P=14\% \text{ } 0.14 \text{ [10]}$$

D= Acceptable error will be 0.05 or 5%

In this case 95% confidence level has 5% errors. Therefore 0.05 will be the level of significance

$$n = \frac{1.96^2 \times 0.14(1 - 0.14)}{0.05^2} = 185$$

n= 185 newborns

However, for the purpose of this research, 60 participants were involved due to limited resources and time

Sampling procedure

Simple Random sampling technique was used where all mothers with an even inpatient number were considered every after 3days

Data collection methods and management

Pre-designed open and closed ended questionnaires and new ballard score was used to assess the age of new borns

Data analysis

The data was presented in form of tables, Bar Graphs and Pie charts.

Ethical Consideration

Permission was sought from Kampala international university ethics and research committee for faculty of clinical medicine and dentistry and Director of HRRH.

RESULTS

1]. However, among all pre-term birth, majority 10 (50%) had birth between 28 and 32 week, 4 (20%) delivered at <28 weeks, while 6 (30%) delivered at 33-36 gestation age [Figure 1].

A pie chart showing prevalence of pre-term births in HRRH

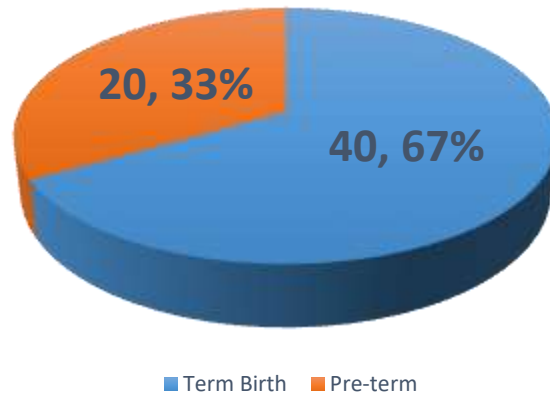


Figure 1: Prevalence of pre-term births at Hoima Regional Referral Hospital

A graph showing distribution gestation age among pre-term births.

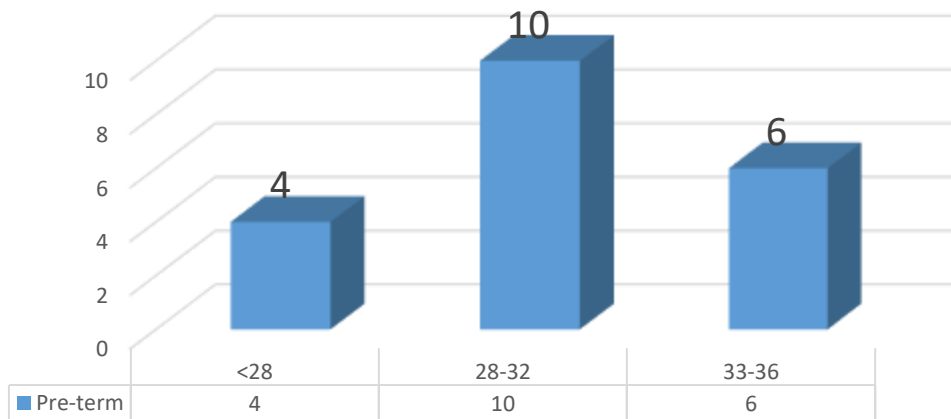


Figure 2: Distribution of gestation age among pre-term births at Hoima Regional Referral Hospital

Mothers (pre-term) 15 years and above at HRRH were interviewed of which majority 8 (40%) and 8 (40%) were of age group 15-24 and above 44 years respectively. A few 4 (20%) were of age group 25-44 years. However, among mothers who delivered to term, 10 (25%) were of age group 15-24 years and 11 (27%) were of age group 25-34 year. Additional 10 (25%) and 9 (22%) were of age group 35-44 and above 44 years respectively [Table 1].

Majority of mothers who had pre-term births were married and divorced

(separated) making 8 (40%) and 7 (35%) respectively. This was followed by single mothers 5 (25%). On the other hand, most of mother who delivered to term were married and single with 18 (45%) and 14 (35%) respectively [table 1]

In both pre-term and term mothers, majority were illiterate or stopped in primary level. Forty five percent of mothers who had pre-term birth were illiterate and 7 (35%) were primary level mothers. Additionally, 18 (45%) and 14 (35%) of mothers who delivered to term

were illiterate and primary level mothers respectively. Only a few pre-term and term mothers had attained secondary and

tertiary level of education [3 (15%) Vs 1 (5%)] and [9 (22.5%) Vs 6 (15%)] respectively [table 1].

Table 1: Social demographics of mothers

Variable		Pre-term Birth	Term Births	
Maternal (n=60)	Age	15-24	8 (40%)	
		25-34	2 (10%)	
		35-44	2 (10%)	
		Above 44 years	8 (40%)	
Marital status	Married	8 (40%)	18 (45%)	
		Single	5 (25%)	14 (35%)
		Divorced	7 (35%)	8 (20%)
Mothers Level	Education	Illiterate	9 (45%)	
		Primary	7 (35%)	
		Secondary	3 (15%)	
		Diploma and above	1 (5%)	
		14 (35%)	11 (27.5%)	
		9 (22.5%)	6 (15%)	

Data on alcohol use and smoking among mothers during pregnancy was also documented. Majority of pre-term and term mothers were neither smoking nor using alcohol. Among mothers who had pre-term births only [4/20] and [3/20]

used alcohol and smoked during pregnancy respectively. However, for term mothers, [5/50] and [13/40] respectively smoked and used alcohol during pregnancy. [Fig. 2].

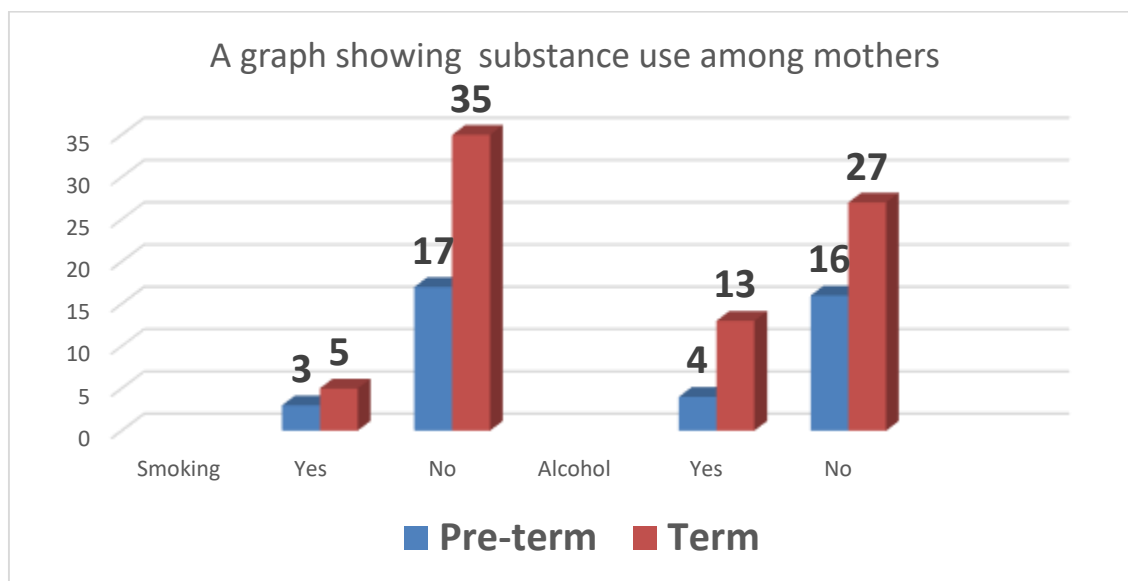


Figure 2: Number of mothers who used alcohol and smoked during pregnancy

A quarter 15 (25%) of participants had a history of pre-term births. Majority of mothers who had pre-term births never had a history of pre-term births compared to those who had history of pre-term births [15 (75%) Vs 5 (25%)]. In the same way majority of mothers who had birth to term never had a history of pre-term birth [30 (75%) Vs 10 (25%)].

Mother's history of infection during pregnancy was measured using reported cases malaria and UTIs. A total of 34 (56.7%) and 32 (53.3%) mothers respectively reported experiencing UTI and Malaria during pregnancy. Compared to their counter parts mothers who reported UTIs during pregnancy were more likely to have pre-term births [16

(80%) Vs 4 (20%]. Additionally, mother who never experienced UTI during pregnancy were more likely to deliver to term compared to those who reported UTIs during pregnancy [22 (55%) Vs 18 (45%)]. This was statistically significant at 95% Confidence level with P-value 0.01.

More so, mothers who reported Malaria during pregnancy were more likely to have pre-term births compared to their counter parts [16 (80%) Vs 4 (20%)]. Additionally, mother who never experienced Malaria during pregnancy were more likely to deliver to term compared to those who reported malaria during pregnancy [24 (60%) Vs 16 (40%)]. This was also statistically significant at 95% Confidence level with P-value 0.003 [table 2]

Majority of mothers who had pre-term births never reported any history of gestational diabetes during pregnancy [16 (80%) Vs 4 (20%)]. Additionally, less than half of mother who delivered to term had

history of gestational diabetes during pregnancy [14 (35%) Vs 26 (65%)].

Thirty one percent (31.3%, n=16) of mother who had history gestation hypertension had pre-term births. Majority of mothers who had pre-term births never reported any history of gestational hypertension during pregnancy [15 (75%) Vs 5 (25%)]. Additionally, less than half of mother who delivered to term had history of gestational hypertension during pregnancy [11 (27.5%) Vs 29 (72.5%)].

Thirty eight percent (38.3%, n=60) of all mother reported having PROM. However, compared to their counter parts mothers who had pre mature rapture of the membrane (PROM) were more likely to have pre-term births [15 (75%) Vs 5 (25%)]. Additionally, mother who never PROM was more likely to deliver to term compared to those who reported PROM [32 (80%) Vs 8(20%)]. This was statistically significant at 95% Confidence level with P-value <0.001.

Table 2: Maternal factors associated with pre-term birth

Variable		Pre-term births	Term births	P-value
UTIs during pregnancy	Yes	16 (80%)	18 (45%)	[n=60, P=0.01]
	No	4 (20%)	22 (55%)	
Malaria during Pregnancy	Yes	16 (80%)	16 (40%)	[n=60, P=0.003]
	No	4 (20%)	24 (60%)	
History of Pre-term births	Yes	5 (25%)	10 (25%)	[n=60, P=1.00]
	No	15 (75%)	30 (75%)	
Gestational Diabetes	Yes	4 (20%)	14 (35%)	[n=60, P=0.232]
	No	16 (80%)	26 (65%)	
Gestational Hypertension	Yes	5 (25%)	11 (27.5%)	[n=60 P=0.836]
	No	15 (75%)	29 (72.5%)	
PROM	Yes	15 (75%)	8 (20%)	[n=60, P<0.001]
	No	5 (25%)	32 (80%)	

Over 70% (43) mothers gave birth of 2.6 kg and above with less. Pre-term birth are likely to be of less weighted infants compared to term birth. Majority of pre-

term birth 12 (60%) were of weight 2.5 kg and below. On the other hand, majority of term births 35 (87.5%) were of higher weight 2.6 kg and above. Pre-term births

are more likely to be of less weighted infants unlike term birth and this is statistically significant at 95% confidence level with P-value of 0.002.

Majority of pre-term births are of male infants than females [13 (65%) Vs 7 (35%)]. On the other hand, majority of term birth

are for female infants compared to males [22 (55%) Vs 18 (45%)]. Unlike term birth, pre-term births are likely to be of male infants, though this is statistically not significant at 95% confidence level [P-value= 0.144, n=60].

Table 3: Infant factors associated with Pre-term birth

Variable		Pre-term birth	Term births	P-Value
Infant Birth Weight (kg)	<1.5	4 (20%)	1 (2.5%)	[n=60 P=0.002]
	1.5-2.5	8 (40%)	4 (10%)	
	2.6-4.0	4 (20%)	15 (37.5%)	
	>4.0	4 (20%)	20 (50%)	
Infant Gender	Male	13 (65%)	18 (45%)	[n=60, P=0.144]
	Female	7 (35%)	22 (55%)	

The results for statistical analysis of maternal and neonatal characteristics study participant of current pregnancy outcome (pre-term and term births) have been presented in Table 4.2 and Table 4.3. Using a linear regression analysis, results indicate that having a preterm birth was not statistically significant maternal history of Pre-term births, gestational Diabetes and gestational Hypertension, and Infant Gender.

However, presence of infections like UTIs and malaria during pregnancy, having pre-mature rapture of the membrane (PROM) and Infant Birth Weight (kg) were significantly associated with pre-term birth among mother delivering at Hoima Regional Referral Hoima (HRRH). Mother

who experienced malaria during pregnancy were 0.36 times more likely to have pre-term births [Co=0.36, CI (0.127-0.587), & P value=0.003] at 95% confidence level. Additionally, mother who reported having Urinary Tract Infections (UTIs) were 0.32 times more likely to have pre-term birth compared to their counter parts at 95% confidence level [Co=0.32, CI (0.081-0.553), & P value=0.009]. In the same way mothers who experienced pre-mature rapture of the membrane (PROM) before birth were 0.52 times more likely to have pre-term birth compared to their counter parts at 95% confidence level [Co=0.52, CI (0.301-0.733), & P value <0.001].

Table 4: Linear regression analysis involving infections during pregnancy and PROM in relation to pre-term births

Variable		Coefficient of regression	Confidence Interval (CI) 95%	P-value
Malaria during pregnancy	Yes	0.36	0.127-0.587	0.003
UTI during pregnancy	Yes	0.32	0.081-0.553	0.009
PROM	Yes	0.52	0.301-0.733	<0.001

DISCUSSION

The present study was designed to investigate the prevalence of preterm birth and its association factors that contributed to preterm birth at Hoima Regional Referral. The prevalence of preterm birth was found in current study to be (33%) which is greater than the rates national rates (14%) and those reported for African (11.9%). The high rates of

preterm birth found in present study might reflect a gap in different programs introduced by Uganda Ministry of Health to improve health service quality delivered to pregnant women including pre-pregnancy and pregnancy health care [10, 11, 12].

The study found that being less educated and young age pregnancy increased the

risk of preterm birth and this could be related to the poor economic situation faced by less educated women and young girls. There is existing literature regarding the role of low socioeconomic status in increasing risk preterm birth rates. Therefore, low educational level of mothers was associated though not significant with risk of preterm birth [13, 14]. Presence of intrauterine infection and malaria during pregnancies along with the disorders associated with preterm birth might explain high rates preterm births. Other important risk factors were premature rupture of the membrane hypertension that increased the risk of preterm birth. This prevalence of 75%

preterm (premature) rupture of membrane in the present study was the most common cause of preterm birth. Similar to present study preterm rupture of membrane has been reported to be related significantly to preterm birth [15, 16, 17, 18]. In the present study, factors like maternal substance use during pregnancy, previous history pre-term births and gestational diabetes and hypertension were found to be related but not significant risk factors resulting in preterm birth. This contradict with many previous studies on preterm deliveries were these factors contributed significantly to pre-term deliveries.

CONCLUSION

A total of 60 mothers who delivered at Hoima Regional Referral Hospital (2021) were interviewed and their gestation age at delivery was recorded. Among all mothers, 20 (33%) had pre-term birth (<37 weeks) while 40 (67%) had births to term (37-41 weeks). However, majority of mother with pre-term births were less educated, and within the age group of 15-24 years and above 44 years. Pre-term births were significantly associated with infections during pregnancy and pre-

mature rupture of the membrane and low infant birth weight. Although maternal history of Pre-term births, gestational Diabetes and gestational Hypertension, and Infant Gender was related to pre-term birth, it was not statistically significant. Classifying pregnant women at the risk of preterm birth and improving quality of healthcare, community health education and awareness campaigns may decrease the rate of preterm birth and its consequences.

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