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Predictors and Prevalence of Premature Birth in Vihiga County

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Abstract: ***Objective: The purpose of this study was to assess factors associated with premature births among women delivering in Vihiga county. Design: The study was a descriptive cross-sectional study. Setting. The study was carried out in Vihiga County Sample. The study population comprised of all mothers who delivered at Vihiga Hospital and their newborns. The study used systematic sampling method (n = 166) Analysis. Data was analyzed through descriptive statistics and chi square test of independence. Main outcome measures: Fetal factors, pregnancy related factors, antenatal factors, delivery factors and obstetric factors. Results: All the mothers interviewed were aged 18 years and above (100%). Most of the mothers (79%) were married, with 19% being single and 2% being earlier married but now separated/divorced. Seventy six percent of the mothers had attained post-primary level of education. The average gestational period was 33 weeks and 39 weeks for preterm and term babies respectively. The average weight of babies for the preterm and term groups was 2.0 kg and 3.1kg respectively. Statistics of the babies delivered show that 47% were female and 53% being male. A majority of the mothers had a parity of four and less. Of all the mothers who were interviewed, 98% attended ANC with 71% attending 3 or more times. Of the mothers interviewed, 40% of preterm deliveries were via C/S compared to 26% among those who delivered vaginally. Of the mothers interviewed, 32% and 8% of mothers in the preterm and term groups had PIH while 13% and 5% of mothers in the two groups had APH respectively. Findings also revealed that biological factors including high parity, gender, previous preterm birth, twin gestation, PIH, APH, prolonged PPROM and UTI in pregnancy were all significantly associated with preterm birth.APH and parity ≥4 was strongly associated with early (<34 weeks) preterm delivery while multiple gestation, PIH and UTI were more strongly associated with late (>34 weeks) preterm birth. PROM and previous preterm birth were associated with early and late preterm delivery almost equally. Conclusion: The study established that fetal factors, pregnancy related factors, antenatal factors, delivery factors and obstetric factors are significant predictors of prematurity. The study also recommends that mothers with antepartum bleeding and grand multiparity should receive intensified prenatal care given the risk of early preterm delivery.***

Keywords: Prematurity, factors, prevalence, Vihiga county, Kenya

1. Background

Preterm birth is defined by World Health Organization as all births before 37 completed weeks of gestation or fewer than 259 days since the first days of a woman's last menstrual period .There are sub-categories of preterm birth based on gestational age ;extreme preterm less than 28 weeks ,very preterm 28 to 32 weeks and moderate to late preterm 32 to 37 weeks(WHO 2014).Of the estimated 130 million babies born each year globally, approximately 15 million are born premature ,prematurity is a major determinant of neonatal mortality and morbidity as well as significant contributor to long term adverse health outcomes ,World Health organization estimates the prevalence of preterm birth to be 5 to 18 % across 184 countries of the world(WHO 2014).Statistics from countries with reliable data show that preterm birth is on the rise (Lawn ,J et al., 2012). New global estimates show that in 2014, approximately 10.6 % of all live births globally were preterm (Lancet Global Health 2014). In 2010 an estimated 14.9 million babies were born preterm, 11.1% of all live births worldwide raging from about 5% in severe European countries to 18% in some African countries (Blencowe et al., 2010). Preterm births also affect developed countries, for examples USA has high rates and is one of the ten countries with the highest number of preterm births, of the 65 countries with estimated time trends, only the Croatia, Ecuador, and Estonia has reduced preterm birth rates between the year 1990 to 2010 (Blencowe et al., 2010). In Africa the frequency of pregnancy affected by preterm births is increasing with a prevalence of 7.4% with 68.2% of preterm births occurring spontaneously, in spite of improvement in neonatal care, preterm birth is now the biggest single cause of death and longer disability in Africa (WHO 2014).In Kenya 193000 babies are born prematurely each year and 13300 children under five die due to direct preterm complication (WHO 2014)A study conducted at Kenyatta National Hospital by Peter, W et al showed a prevalence of 18.3%.Newborns are perhaps the most vulnerable population in the world (UNICEF 2014).Kenya like most developing countries lack reliable data on the burden of preterm delivery, Kenya is among the top 15 countries with the highest rate of premature births ,in Kenya about 14000 preterm babies lose their lives due to various health complications(MOH 2015).

The socio demographic factors which are associated with Preterm birth include extremes of maternal age, low level of education, low socioeconomic status and occupation, single marital status, nutritional status, smoking and alcohol use (Peter, W et al 2019). The mechanisms by which the maternal demographic characteristics are related to preterm birth are unknown. Lopez A et al in the United Kingdom found that maternal age more than 39 years and prenatal smoking were significantly associated with preterm delivery. In Pakistan, Irshad Mohammed et al in their study of 205 preterm births found that about 25% of the mothers were aged 35 years and above. Shrestha et al in a study of 164 preterm admitted in a Neonatal Intensive Care Unit in Nepal found that 35% of mothers who delivered prematurely were teenagers. Sebayang et al., in Lombok, Indonesia, analyzed data from the Supplementation with Multiple Micronutrient Intervention Trial (SUMMIT), a double-blind cluster-randomized controlled trial of a cohort of 14,040 singleton births to examine determinants of preterm birth, Low birth

weight and Small for gestational age. The results showed that women with high school education (≥ 10 years of education) had 36% lower odds of having preterm birth (OR 0.64), compared with women with no primary education while maternal age was not significantly associated with preterm birth. In the same study, maternal Mid upper arm circumference <23.5cm was significantly associated with the 3 adverse pregnancy outcomes which is similar to the findings of a study by Kalanda B in a rural district in Malawi, that found that low maternal Mid upper arm circumference (<23cm) was significantly associated with low birth weight, preterm birth and intrauterine growth restriction.

Pregnancy-related factors have been associated with preterm birth (Peter, W et al 2019). These include premature rupture of membrane (PROM), parity, Antenatal attendance, previous preterm birth, Antepartum hemorrhage (APH), pregnancy induced hypertension (PIH), interpregnancy interval, anemia in pregnancy, urinary tract infection and Human Immunodeficiency Syndrome infection. A study of 315 preterm babies in India by Shubhada A et al found that previous history of preterm delivery and recurrent maternal urinary tract infection were significantly associated with preterm birth, while pregnancy induced hypertension and antepartum hemorrhage were not. In this study, 36.8% of cases were idiopathic, 59% underwent Caesarean section and about 50% occurred in those whose parity was more than two. In a comparative cross-sectional study in the Qom province of Iran in 2008, Jandaghi and Khalajinia found that history of previous preterm birth, maternal anemia, Premature rupture of membrane, placental abruptio and Urinary tract infection were significantly associated with premature birth while Pregnancy induced hypertension was not. On controlling for confounding using logistic regression models, results showed that placental abruption (OR=8), previous preterm delivery (OR =3.48), Premature rupture of membrane (OR=3.78) and anemia (OR= 2.8) remained significant. Among singleton deliveries in a tertiary hospital in the United Kingdom, Lopez A. et al found that history of previous preterm birth was significantly associated with preterm birth while anemia (Hemoglobin level <10.5 g/dl) and parity were not.

Fetal gender has been associated with preterm birth. It has been long noticed that female fetuses have a better perinatal survival than male fetuses. Male fetuses are at an increased risk of being born preterm when compared to female fetuses in both singleton and twin pregnancies and generally males have poorer perinatal outcomes. The mechanisms for this observation remain unclear. A study done by Zeitlin et al showed that males were more likely to be born prematurely regardless of the type of labor. In the SUMMIT study, there was no association between infant sex and premature delivery while Ezechi et al in Nigeria found that female babies accounted for 55% of preterm births. A study done by Peter Wagura at Kenyatta National Hospital also showed that sex of the baby had no association with preterm birth.Lack of data on the problem of Preterm birth locally and the fact that reduction and prevention of prematurity requires a better understanding of the likely mechanisms as well as the factors associated with preterm birth made this study very important. The study has therefore gone a long way in providing relevant data to bridge the knowledge gap that existed regarding factors associated with premature births among women delivering in Vihiga county. The finding of this study will contribute to the body of knowledge regarding factors associated with preterm birth and help policy makers to formulate relevant and practical measures to tackle this problem.

2. Methods

Permission was sort from the college Research Committee and the nursing Research and Ethical Review committee of Vihiga county referral hospital (VCRH) through the medical superintendent and prior to commencement of the study. Informed consent was obtained from the mothers. The right to participate in the study or not rested with the mother and this was respected at all times during the study. Mothers were informed that it was their right to choose whether to participate in the study or not and even withdraw from the study at any time. This was not affected the care they and their babies received. No inducements or rewards were given to participants to join the study. Confidentiality was maintained at all times. No identifying data was recorded and all information given was used strictly for research purposes only. There were no invasive procedures carried out on the participants, so no physical risks were encountered.

Research Design

This study utilized a cross-sectional descriptive study design, it can used to describe not only the odds ratio but also absolute risk and relative risks from prevalence, it involved data collected at a defined time and used to assess the prevalence of acute or chronic conditions. A descriptive survey design is a scientific method which involves observing and describing the behavior of a subject without influencing it in any way (parloo, 2010).

Study setting

The study is conducted in Vihiga county referral hospital, Vihiga County. VihigaCounty is among the four counties in western region. The bordering counties include Kisumu,Kakamega, Siaya and Nandi County, the county has an approximate population of about 554,622 people spread in all five sub counties (census report 2009). In each sub county there is a sub county hospital and a health Centre that renders comprehensive health care services including antenatal clinic with at least one qualified Nurse (midwife).Mbale town where the study is carried out is the head quarter of the Vihiga County which is entirely designated as an urban Centre. It is situated at almost the Centre of all the five sub counties. It comprises an area approximately 205 sq. km. the population of Mbale town is approximately 71,131 of which 40% are the women of the reproductive age, Vihiga County Referral Hospital is the largest hospital in Vihiga County, a level five hospital. The hospital started as a district hospital in the year 2005 and later recognized as a teaching and research hospital.

Participants

Study population is a study of a group of individuals taken from the general population who share a common characteristic (Mugenda and Mugenda, 1999). The study population comprised of all mothers who delivered at

Vihiga Hospital and their newborns. The inclusion criteria were all mothers who had live births at Vihiga County Teaching and Referral Hospital, who gave consent and their newborn babies were recruited into the study.All mothers who would not give consent to participate in the study were excluded. Mothers who developed complications after delivery and who were unstable to communicate because of their ill health were also excluded from the study.The study used systematic sampling method. Using the average number of deliveries recorded monthly in Vihiga hospital which is 500 per month, it was divided by the sample size (500/166=3) and the kth in the systematic sampling which is every 3rd mother who gave birth in the labor ward was taken

Questionnaire

Data was collected using a pretested questionnaire, administered to the eligible mothers in the maternity and newborn units, because; It permitted greater depth of response, it was economical in terms of time and money, it was easy to analyze and closed-ended questions are easier to formulate Medical records specifically the antenatal record and mothers' admission files were retrieved to provide additional information which were entered in the standardized questionnaire as required. Validity is the degree to which an instrument measures what is supposed to be measured. The validity of both instruments was established by a thorough review of the literature and conducting a pilot study. Those questions that were not clear were modified in order to improve on the validity of the responses during the actual data collection in relation to consulting expert opinions. Reliability is the measure of degree to which a research instrument yields consistent result after repeated trials. The test retest method was used to test for the reliability of the instrument used in the study by implementing questionnaire at two separate times for each subject. The correlation between the two separate measurements was then computed with an assumption that there was no change in the underlying condition between test 1 and test 2. Data was collected, stored safely and analyzed by the investigator to minimize error caused by different investigators.

Data Analysis

Data analysis was done using the statistical program for social sciences (SPSS) version 20. Inferential and descriptive statistics were used to analyze data. Visual inspection of the data illustrated that missing data appeared to be missing at random. Elimination of observed outliers was based on a case by case basis, dependent on standard deviations, and on normality and homogeneity of variance assessments. Univariate analysis was used to describe the distribution of each of the variables in the study objective, appropriate descriptive analysis was used to generate frequency distributions. Bivariate and multivariate analysis was used to investigate the strength of the association and check differences between the outcome variable and other independent variables. Alpha level for all the computations was considered $p < 0.05$.

3. Results

The study asked the respondents to indicate their background characteristics based on the age, marital status, education level, employment status and drug abuse. The summary of their responses is given in Table 1.

Table 1: Characteristics of the Mothers

Variable	*Frequency (n=166)*	*Percentage (%)*
Age		
Over 18	166	100
Under 18	0	0.0
Marital Status		
Single	31	18.8
Married	131	78.8
Divorced/Separated	4	2.5
Education Level		
Primary Level	31	18.8
Secondary Level	60	36.3
College/University Level	67	40
Post Graduate	8	5
Employment Status		
Unemployed	77	46.3
Employed	89	53.8
Drug Abuse (Self/Partner)		
No	160	96.3
Yes	6	3.8

All the mothers interviewed were aged 18 years and above (100%). Most of the mothers (79%) were married, with 19% being single and 2% being earlier married but now separated/divorced. Seventy six percent of the mothers had attained post-primary level of education. A majority of the mothers were employed (54%) and 96% of the mothers interviewed and/or their spouses had not abused any form of drug during pregnancy.

Fetal factors

The average gestational period was 33 weeks and 39 weeks for preterm and term babies respectively. Of the preterm births, 3% were extreme preterm (<28 weeks), 16% were severe preterm (28-31 weeks), 19% were moderate preterm (32-33weeks) and 62% were late preterm (34-36 weeks). The average weight of babies for the preterm and term groups was 2.0 kg and 3.1kg respectively. About 10% of term babies were LBW (weight <2500 grams). This is not displayed in the figure. Approximately 60% of the preterm babies had a birth weight of between 1.5kg to 2.5kg while 3% had a weight of less than 1kg. Summary of findings is in Table 2.

Table 2: Fetal factors

Items		Frequency	Percent
Preterm babies according to gestation	28-below	5	3%
	28-31 weeks	27	16%
	32-33 weeks	32	19%
	34-36 weeks	103	62%
Birth weights	1 kg and less	5	3%
	1kg -1.5 kg	27	16%
	1.5-2.5 kgs	98	59%
	2.5 kgs and above	37	22%

Statistics of the babies delivered show that 47% were female and 53% being male. Out of the term babies, 48% were female and 52% were male; of the preterm babies, 46% were female and 54% were male. This is depicted in the figure 1 below.

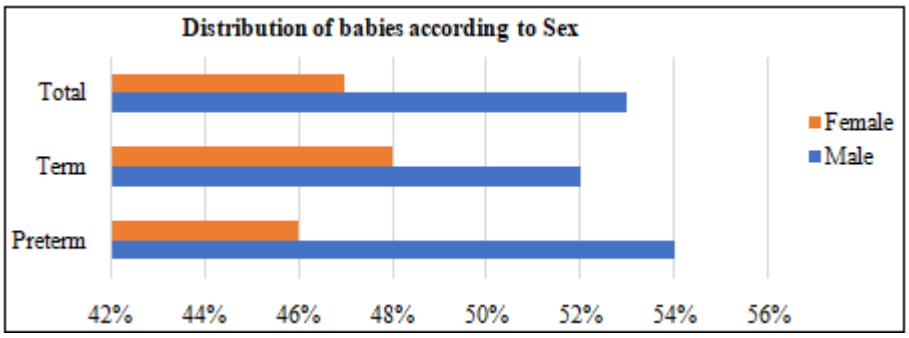

Figure 1: Sex of the baby in relation to preterm birth

Pregnancy Related Factors

A majority of the mothers had a parity of four and less. For those mothers with a parity of 4 and above, there was a significant association with preterm birth. For those mothers who delivered before term about 35% of them had a history of previous preterm delivery compared to 16% of those who delivered at term. Approximately 34% of mothers in the preterm group and 25% of those in the term group had a history of previous pregnancy loss. In the preterm category, approximately 6% of the mothers and 11% in the term group had an interpregnancy interval of less than 24 months. The relationship between preterm birth and previous pregnancy characteristics is depicted in Table 3 below.

Table 3: Pregnancy Related Factors

Characteristic	*Term (n=136)*	*(%)*	*Preterm (n=30)*	*(%)*	*Chi square (χ^2)*
Parity					
Greater than 4	2	(1.5)	2	(6.8)	χ^2(df=1) =6.354, p=0.01
Less than 4	134	(98.5)	28	(93.2)	
Previous Pregnancy outcome					
Dead/Miscarried	34	(24.8)	10	(34.3)	χ^2(df=1) =1.224, p=0.02
Baby alive	102	(75.2)	20	(65.7)	
Previous Preterm					
Yes	21	(15.6)	11	(35.3)	χ^2(df=1) =5.789, p=0.02
No	115	(84.4)	19	(64.7)	
Interpregnancy Interval (Months)					
<24	15	(10.9)	2	(5.7)	χ^2(df=1) =8.021, p=0.03
>24	121	(89.1)	28	(94.3)	

Antenatal Factors

Of all the mothers who were interviewed, 98% attended ANC with 71% attending 3 or more times. The proportion of mothers who did not attend ANC in the term and preterm groups was 2.3% and 4% respectively. Mothers who had not had any antenatal care were one and a half times more likely to deliver preterm. About 29% of mothers in term and 35% in preterm group had less than 3 antenatal visits. Approximately 13% of preterm mothers and 12% of term mothers were HIV positive. The proportion of women who had anemia during pregnancy was the same for the term and preterm. Table 4 shows the association between preterm birth and antenatal factors.

Table 4: Association between Antenatal factors and Preterm Births

Characteristic	Term n	(%)	Preterm n	(%)	Chi square (χ^2)
ANC Attendance					
Yes	132	(97.7)	29	(96)	χ^2(df=1) =1.113, p=0.01
No	3	(2.3)	2	(4)	
No. of ANC visits					
Less than 3	39	(29)	11	(35)	χ^2(df=1) =5.231, p=0.01
More than 3	94	(71)	22	(65)	
HIV Status					
Seropositive	15	(12)	4	(13)	χ^2(df=1) =4.237, p=0.02
Seronegative	115	(88)	32	(87)	
Hemoglobin (g/dl)					
Less than 10	34	(29)	7	(28)	χ^2(df=1) =7.113, p=0.03
More than 10	82	(71)	43	(72)	

Delivery Factors

Of the mothers interviewed, 40% of preterm deliveries were via C/S compared to 26% among those who delivered vaginally. The Caesarean section (C/S) delivery rate was 28.3% among all participating mothers. About 28% and 36% of mothers in the term and preterm group respectively had induced labor or through medically indicated C/S. The percentage of twin pregnancy among women who delivered at term and preterm was 2% and 7% respectively. The table below (4:5) shows the association between preterm birth and delivery factors.

Table 5: Association between preterm birth and delivery factors

Characteristic	Term n	(%)	Preterm (n)	(%)	Chi square (χ^2)
Mode of Delivery					
C/S	35	(25.9)	12	(39)	χ^2(df=1) =4.221, p=0.03
Vaginal	101	(74.1)	18	(61)	
Onset of Labor					
Induced/Medical C/S	38	(27.8)	11	(35.6)	χ^2(df=1) =6.345, p=0.04
Spontaneous	98	(72.2)	19	(64.4)	
Pregnancy Outcome					
Twins	3	(1.9)	2	(6.8)	χ^2(df=1) =2.304, p=0.01
Singleton	133	(98.1)	28	(93.2)	

Obstetric Factors

Of the mothers interviewed, 32% and 8% of mothers in the preterm and term groups had PIH while 13% and 5% of mothers in the two groups had APH respectively. 27% of the mothers who had preterm delivery and 8% of those who delivered at term had a history of PROM for more than 18 hours while 47.5% of mothers in preterm group and 32% of those in the term group respectively reported having had UTI or burning sensation during pregnancy. Table 6 below shows the association of these factors.

Table 6: Preterm Birth and Obstetric factors association

Characteristic	Term (n)	(%)	Preterm	(%)	Chi square (χ^2)
Pre-eclampsia					
Yes	11	(8.4)	10	(32.2)	χ^2(df=1) =2.214, p=0.02
No	124	(91.6)	21	(67.8)	
APH					
Yes	7	(5.3)	4	(13.6)	χ^2(df=1) =4.210, p<0.01
No	128	(94.7)	27	(86.4)	
PROM>18HRS					
Yes	11	(8.4)	8	(27.1)	χ^2(df=1) =6.321, p<0.01
No	124	(91.6)	23	(72.9)	
History of UTI					
Yes	43	(31.9)	14	(47.5)	χ^2(df=1) =3.112, p<0.01
No	92	(68.1)	17	(52.5)	

4. Discussion

The purpose of this study was to assess factors associated with premature births among women delivering in Vihiga county. The preterm birth rate in the current study was found to be 17.9% This is similar to the 15% reported by Shubhada et al., in a Medical College Hospital in India and the 16.4% reported in a study in Harare Maternity Hospital in Zimbabwe. It is also similar to the 16.8% reported by Nynke R and his colleagues in Malawi that involved secondary analysis of data from community based randomized placebo-controlled trial for the prevention of preterm birth and WHO population-based estimates of preterm birth that indicate that most countries with a prevalence of more than 15% are in sub-Saharan Africa. The prevalence of preterm birth in the present study was however higher than the 12% reported by Olugbenga et al in the University of Ilorin Teaching Hospital, Nigeria. Though done in a teaching hospital similar to that of the current study, this Nigerian study excluded mothers who were unsure of dates; those who had a discrepancy of more than 2 weeks between gestation by dates and Ballard's assessment and multiple gestations and may have thus underestimated the prevalence of preterm delivery.

Other studies had shown that advanced maternal age and being unmarried were associated with prematurity but this was not demonstrated in the current study. Earlier studies had reported conflicting findings on the association between maternal education and preterm birth. Education level was not associated with preterm delivery in the present study. This may be due increased access to basic education among the mothers in this study whose background was mainly urban. As had been shown by Khalajinia et al, maternal occupation was not associated with preterm birth. Unlike what had been found in previous studies in Japan and Italy no association between smoking as well as alcohol use and preterm birth was found. However, the finding of the current study was similar to that of Bayingana et al in Rwanda This may be largely because smoking and alcohol use by women is not prevalent in Africa due to cultural influences. Previous preterm delivery was associated with preterm birth and this was similar to the findings of other studies. This may be due to the persistence of unidentified factors in some women precipitating preterm delivery. The current study demonstrated that mothers with a parity ≥4 were 4 times more likely to deliver prematurely. This finding is similar to that of previous studies which had shown that multiparous women were more likely to deliver preterm. High parity is likely to increase the risk of preterm delivery due to uterine changes such as myometrial stretching from previous pregnancies. Some of the mothers with high parity may also have had a bad obstetric history which may be due to unidentified factors that may persist to subsequent pregnancies. Inter pregnancy interval had no association with preterm birth. This was different from the findings of Gordon et al and Agustin Conde et al but similar to that of J Etuk and others in Nigeria. It is possible that women in our setting recover faster from the effect of previous pregnancy and this may be due to intensified nutritional care of mothers soon after delivery which is a common practice locally. Delivery via Caesarean Section was significantly associated with preterm birth but onset of labor was not. This was similar to the finding of Olugbenga et al in Nigeria. This may be due to obstetric complications such as PIH and APH which were the major causes of iatrogenic preterm birth in this study

Twin gestation was significantly associated with preterm birth in this study. This is similar to the findings of J Etuk et al. Multiple gestation is associated with uterine overdistension and this may result in spontaneous preterm labour. In addition, other complications such as pre-eclampsia are more likely to occur with multiple gestation and thus contribute to iatrogenic preterm birth. Male infants are at increased risk of being born prematurely. ANC attendance as well as number of antenatal visits was not associated with preterm birth unlike the finding of Feresu A et al in Zimbabwe. This may have been due to the Focused Antenatal Care (FANC) approach in Kenya which has emphasized the need to have four targeted antenatal visits.
Maternal HIV status was not associated with preterm delivery in the current study. This finding was similar to that of J Coley et al in Tanzania and J Ndirangu et al in South Africa. The burden of HIV/AIDS in these studies is comparable to that of the current study. It is possible that with increasing availability and use of antiretroviral drugs for prophylaxis and treatment of HIV in pregnancy, the impact of HIV on pregnancy outcomes may have been reduced. Anaemia in pregnancy had been associated with preterm birth in some studies but not in others. UTI in pregnancy was associated with premature birth. This was similar to the findings of studies in Iran, Nigeria and Egypt. Due to morphological and functional changes that occur in pregnancy, stasis of urine favors UTI. Like other infections, UTI stimulates the production of cytokines which may induce preterm labor through release of prostaglandins. This study showed that prolonged ROM (>18 hours) was associated significantly with preterm birth. Lopez et al, Olugbenga et al and Khalajinia et al had reported similar

findings. PROM has been associated with chorioamnionitis which may be subclinical and this may cause preterm labor by inducing the release of inflammatory mediators. Most previous studies had shown that PIH and APH were associated with preterm delivery while a few had not. This study confirmed that the two factors have significant association with preterm birth. PIH may cause uteroplacental ischemia and thus predispose to poor pregnancy outcomes while significant APH often leads to delivery due to the risk it poses to the pregnant woman. In the current study, PIH and APH were the main causes of medically indicated preterm delivery. As had been demonstrated in earlier studies, the present study showed that PROM, previous preterm birth and APH were associated with early preterm birth. However, the current study showed that pregnancy induced hypertension as well as twin gestation was more strongly associated with late preterm birth than with early preterm delivery.

5. Conclusion& Recommendation

The study established that the preterm birth rate in Vihiga county was 17.9%, biological factors including high parity, gender, previous preterm birth, twin gestation, PIH, APH, prolonged PPROM and UTI in pregnancy were all significantly associated with preterm birth. In addition, socio-demographic factors were not associated with preterm delivery in this study. and Only PIH, APH and prolonged PPROM remained significant on controlling for confounders. Finally, APH and parity ≥4 was strongly associated with early (<34 weeks) preterm delivery while multiple gestation, PIH and UTI were more strongly associated with late (>34 weeks) preterm birth. The study also recommends that health education on the risks posed by high parity should be emphasized to women of reproductive age and their communities and family planning promoted. The study also recommends that mothers with antepartum bleeding and grand multiparity should receive intensified prenatal care given the risk of early preterm delivery.

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