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Maternal Medical Conditions Associated With Birth Asphyxia at Kenyatta National Hospital and Pumwani Maternity Hospital, Kenya.

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Abstract

Introduction: Birth asphyxia is a serious condition in the neonate worldwide. It is the second leading cause of neonatal mortality at 24% in the world. It accounts for an estimated 900,000 deaths each year. In Kenya the neonatal mortality was 22.2 per 1000 live births in the year 2015. It therefore remains a severe condition leading to significant mortality and morbidity. The ***objective*** was to identify the maternal risk factors associated with birth asphyxia. ***Methods****:* A cross-sectional study was conducted at Kenyatta National Hospital and Pumwani Maternity hospital among 209 mothers with babies who had birth asphyxia. Purposive sampling was done and a standard questionnaire was used to collect information on socio-demographics, medical conditions in pregnancy and the labour process. Statistical package for social sciences was used t version 23 was used to analyze the data. ***Results:*** A total of 209 mothers were interviewed, the mean age was between 20-30 years, primiparity, anemia in pregnancy, prolonged labour, elevated blood pressure in pregnancy, urinary tract infections, chorioamnionitis, HIV and antepartum hemorrhage were the maternal medical conditions associated with a higher incidence of birth asphyxia. Low levels of education: 80.1% had not received tertiary level education, delay in seeking healthcare services during labour for more than six hours and meconium stained liquor were other factors associated with birth asphyxia. Neonates of male gender and fetal weight above 3 kilograms were the most affected. ***Conclusion:*** Having a medical condition in pregnancy, low literacy levels, delay in seeking healthcare services and prolonged labour were the maternal characteristics associated with birth asphyxia. There is an urgent need to create awareness on prevention of birth asphyxia to save the next generations owing its long-term consequences on psychosocial and economic development.

Keywords: Birth asphyxia, Anaemia, Urinary tract infection, Human Immunodeficiency virus, Primiparity, elevated blood pressure, prolonged labour.

Introduction

Birth asphyxia is the impairment of gaseous exchange to or from the fetus in the period immediately before, during, or after the birth process leading to progressive hypoxemia, hypercapnia, and significant metabolic acidosis. According to WHO (2016), 24% of all neonatal deaths in the year 2015 were due to birth asphyxia. Birth asphyxia has been associated with major sequences such as, cerebral palsy, cognitive impairment, epilepsy and chronic illnesses which develop later in life (Davis *et al*, 2004). 99% of the neonatal deaths occur in Developing Countries, highest death rates in sub-Saharan Africa and Kenya being one of them. In Kenya, the neonatal mortality rate in 2015 was 22.2 per 1000 live births (WHO 2016 report). Therefore, unless there is a reduction in neonatal mortality rates it will be impossible to achieve the Sustainable Development Goal (SDG 3) which says by the year 2030 we should end preventable

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deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1000 live births.

Birth asphyxia contributes significantly to neonatal and infant mortality in Africa. Globally, It also contributes significantly to the 3 million stillbirths that occur annually(Jonathan spector, 2014). Hypoxic Ischemic encephalopathy that is associated with birth asphyxia is a risk factor for neurodevelopmental impairments among survivors. Long-term complications include cerebral palsy, functional disability, cognitive impairment and epilepsy in childhood as full recovery may not occur. (Uleanya, Aniwada, & Ekwochi, 2019).

Several studies related to Birth Asphyxia have been carried out to explore the risk factors for birth asphyxia. Aslam et al (2014) agree that primigravidity, booking status, preeclampsia and maternal age were risk factors for birth asphyxia. According to Tasew et al (2018), maternal illiteracy and, meconium stained amniotic fluid, antepartum hemorrhage and low birth weight were independent risk factors for birth asphyxia. However, limited attempts have been made to establish the association between maternal characteristics and birth asphyxia in Kenyan local health facilities. The data obtained will be used by clinicians to identify and prevent birth asphyxia and thereby contribute to the reduction of perinatal mortality and morbidity in the short term; physical and mental disability in the long term.

Materials and Methods:

This was a descriptive study conducted among mothers who had babies with birth asphyxia admitted in Kenyatta National Hospital newborn unit and Pumwani Maternity hospital newborn unit in Kenya between May 17th and August 1st, 2017. All mothers provided informed consent which was approved by Kenyatta National Hospital/University of Nairobi research and Ethics Committee. A standard questionnaire was used to collect information on socio demographic characteristics of the mothers, medical conditions in pregnancy, labor process, duration of time between experiencing labor and reaching the hospital. The mothers were selected on the basis of Apgar score for their babies; only those mothers with babies who had an Apgar score of less than 7 at 5 minutes were allowed to participate. Those who had babies with congenital anomalies, birth weight less than 2000 grams, a gestational age of less than 34 weeks, gestational age of more than 42 weeks were excluded.

Statistical package for social sciences (SPSS) version 24 was used for data analysis. Multiple logistic regression was used to establish relationships between study variables. A P value of 0.05 and below was taken to be significant.

Results

During the study period a total of 209 mothers were interviewed, the average age of the mothers was 26.7 years with standard deviation of 6.1. Majority of the mothers (63.6%) were within the age group of 20-30 years, 11% of them were less than 20 years of age, 25% of them were aged between 31-42 years. A majority of the mothers (79.4%) were married; single women accounted for (20.6%).

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Regarding level of education; more than half of the mothers (54.1%) attended secondary school education with only a few (24.4%) were primary school dropouts, 2.4% had not received any formal education, 15.8% had received college education and 3.3% had attained university level education.

The study findings also showed that the highest percentage of the mothers (44.0%) was housewives; 23.4% were employed, 23.9% were business women and 8.6% were students. More than half (57.9%) of the mothers who had babies with birth asphyxia had suffered from a medical condition during pregnancy whereas the remaining (42.1%) indicated otherwise. The main medical conditions during pregnancy were anemia (33.1%), prolonged labor (24.0%), elevated blood pressure (14.9%) and urinary tract infection (11.6%).

Mothers who suffered from any medical condition during pregnancy had significantly more babies with grade 2 or 3 asphyxia (64.4%) than grade 1 asphyxia (45.9%) [χ^2 value = 6.71; df =1; P value = 0.010]. Twins was significantly more among babies with grade 1 asphyxia (12.2%) [χ^2 value = 6.93; df =1; P value = 0.008] compared to those babies with grade 2 or 3 asphyxia (3.0%).

Table 1: Demographic characteristics of the mothers

Variables	n=209	%
Age		
<20 years	23	11.0
20-30 years	133	63.6
31-42 years	53	25.4
Mean age (±SD) = 26.7(±6.1)		
Marital status		
Single	43	20.6
Married	166	79.4
Education level		
Not attended school	5	2.4
Primary school	51	24.4
Secondary school	113	54.1
College	33	15.8
University	7	3.3
Occupation		
Business woman	50	23.9
Employed	49	23.4
Student	18	8.6
Housewife	92	44.0

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Table 2: Medical conditions and pregnancy related factors contributing to birth asphyxia.

Variables	n=209	%
Whether suffered from any medical condition during pregnancy		
Yes	121	57.9
No	88	42.1
***Type of the medical conditions during pregnancy**		
Elevated blood pressure	18	14.9
Anemia	40	33.1
Bleeding	6	5.0
HIV	5	4.1
Prolonged labour	29	24.0
UTI	14	11.6
Others	27	22.3
How many babies did you deliver		
Singleton	196	93.8
Twins	13	6.2
***Multiple response where the counts and percentages are more than the total**		

Table 3: Association between Demographic Characteristics Of Mothers And Asphyxia Grade

Variables	Grade 2 or 3, (N=135)		Grade 1, (N=74)		Chi square value	degree of freedom	p value*
	n	%	N	%			
Frequency of ANC visit							
1st visit	6	4.4%	3	4.1%			
2nd visit	9	6.7%	8	10.8%	1.10	3	0.776
3rd visit	23	17.0%	12	16.2%			
4th visit	97	71.9%	51	68.9%			
Whether suffered from any medical condition during pregnancy							
Yes	87	64.4%	34	45.9%	6.71	1	**0.010**
No	48	35.6%	40	54.1%			
How many babies did you deliver							

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Singleton	131	97.0%	65	87.8%	6.93	1	**0.008**
Twins	4	3.0%	9	12.2%			

Discussion

The study found an association between having a medical condition in pregnancy and birth asphyxia. A majority of the mothers (64.4%) had suffered from a medical condition during pregnancy. Anaemia in pregnancy was the most prevalent at 33.1%. Anaemia in pregnancy contributes to reduced oxygen level in the mother's blood resulting in birth asphyxia. This may be attributed to insufficient knowledge and minimal public awareness on preconception care and its availability in public health facilities in Kenya. This supports earlier findings that perinatal anaemia causes moderate to severe birth asphyxia and hence prevention of anaemia in pregnancy and preconception care are key in improving pregnancy outcomes(Goswami et al., 2014).

More than half (54.1%) of the mothers were in secondary school dropouts with unplanned pregnancies in most cases. (24.4%) were primary school dropouts and 2.4% never attended any schooling. Low literacy levels were associated with high rates of school dropouts due to unplanned pregnancies is also associated with birth asphyxia(Hagos Tasew, 2018). Introduction of reproductive health education in primary and secondary school curriculum with emphasis on preconception care may help in improving overall pregnancy outcomes. Nearly half of the mothers (44%) were housewives; dropping out of school due to pregnancy reduces the chances of securing employment therefore limiting their economic opportunities and their ability to access proper nutrition during pregnancy as well as quality healthcare services(Darroch, 2016).

Among the participants, 24% of them had prolonged labour, a majority of whom went in for caesarean section due to fetal distress. This is consistent with the findings in a study done on risk factors for birth asphyxia. (Aslam et al., 2014).It reflects on the situation of maternal-neonatal healthcare services in public health facilities in Kenya. Birth asphyxia and its long term complications will continue to occur unless we increase the levels of in service training for midwives on management of labour and other obstetric emergencies(McClure, 2018).

Those who had elevated blood pressure during pregnancy were 14.9%. Elevated blood pressure in pregnancy is a major health burden in the obstetric population, as it is one of the leading causes of maternal and perinatal morbidity and mortality in Kenya. Prevention, early diagnosis and management is likely to improve pregnancy outcomes among women with this medical complication. Training of healthcare providers on the management of hypertensive disorders of pregnancy may help in reducing maternal and neonatal mortality and morbidity, given that it is the leading cause of perinatal mortality and the third leading cause of maternal mortality in Kenya(Kenya Ministry of Health, 2016). Among the participants, 11.6% of them had a urinary tract infection during pregnancy. This is in line with the findings from a study done on risk factors in children with birth asphyxia (Yadav & Damke, 2017).

The level of Human Immunodeficiency Virus (HIV) exposure among the participants were generally low with only 4.1% having been exposed to HIV. Nevertheless there was no statistical

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significance between HIV and birth asphyxia but other opportunistic infections in HIV may contribute to birth asphyxia. These observations are also supported by findings from another study(Monebenimp, Nga-Essono, Zoung-Kany Bissek, Chelo, & Tetanye, 2011). Other medical conditions included chorioamnionitis, pneumonia, prolonged rupture of membranes and deep venous thrombosis.

Key issues arise from the present study: maternal medical conditions are risk factors for birth asphyxia, low literacy level and school dropouts due to pregnancy have an implication on the overall pregnancy outcomes in Kenya, there is limited public awareness on availability of preconception care and the importance of proper nutrition in pregnancy and there is need for reproductive health education in our education curricula. We therefore recommend that education on preconception care and nutrition during pregnancy should be emphasized during antenatal visits in order to prevent anemia in pregnancy and other fetal complications that may lead to birth asphyxia, specialized training and in-service training for the midwives and other healthcare providers on prevention and management of obstetrics emergencies to keep them abreast of latest developments in maternal and neonatal health. Considering the long term socio-economic implications of birth asphyxia, the seriousness of this condition should be emphasized; a step towards improving our overall pregnancy outcomes in Kenya and beyond.

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Conflict of Interest

The authors have no conflict of interest

REFERENCES

Aslam, H. M., Saleem, S., Afzal, R., Iqbal, U., Saleem, S. M., Shaikh, M. W., & Shahid, N. (2014). "Risk factors of birth asphyxia." *Ital J Pediatr*. https://doi.org/10.1186/s13052-014-0094-2

Darroch. (2016). *Fact sheet teenage pregnancy*.

Goswami, T. M., Patel, V. N., Pandya, N. H., Mevada, A. K., Desai, K., & Solanki, K. B. (2014). Maternal anaemia during pregnancy and its impact on perinatal outcome, *3809*, 5–8. https://doi.org/10.7439/ijbar

Hagos Tasew, M. Z. (2018). Risk factors of birth asphyxia among newborns in public hospitals of Central Zone, Tigray, Ethiopia 2018. *BMC Research Notes*, *10*.

Jonathan spector, S. D. (2014). WHO _ Preventing those so-called stillbirths BIRTH ASPHYXIA.

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ISSN: 2581-3366

Kenya Ministry of Health. (2016). Kenya reproductive, maternal, newborn, child and adolescent health (RMNCAH).

McClure, R. L. G. M. S. S. (2018). Improving pregnancy outcomes in low- and middle-income countries. *Research Gate*, *15*.

Monebenimp, F., Nga-Essono, D. E., Zoung-Kany Bissek, A. C., Chelo, D., & Tetanye, E. (2011). HIV exposure and related newborn morbidity and mortality in the University Teaching Hospital of Yaoundé, Cameroon. *The Pan African Medical Journal*. https://doi.org/10.4314/pamj.v8i1.71160

Uleanya, N. D., Aniwada, E. C., & Ekwochi, U. (2019). Short term outcome and predictors of survival among birth asphyxiated babies at a tertiary academic hospital in Enugu, South East, Nigeria. *African Health Sciences*. https://doi.org/10.4314/ahs.v19i1.29

Yadav, N., & Damke, S. (2017). Study of risk factors in children with birth asphyxia, *4*(2), 518–526.