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Pattern of Perinatal Mortality in Babies Delivered at the University of Ilorin Teaching Hospital, Ilorin, Nigeria

Aspects de la Mortalite Chez Des Bebes a L'Hôpital Universitaire d'Ilorin, Ilorin, Nigeria

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ABSTRACT

BACKGROUND: **Perinatal mortality remains a significant aspect of under-5 mortality, accounting for over 20% of under-five mortality in Nigeria.**

OBJECTIVE: **To determine the pattern of perinatal mortality in the University of Ilorin Teaching Hospital, Ilorin.**

METHODS: **This was a prospective study conducted at the University of Ilorin Teaching Hospital. Data on socio-biologic, antenatal and peripartum characteristics of 1969 gravid women was obtained over a 7-month period (April 2006–October 2006). Data on the 2042 babies delivered was also taken and these babies were followed up till discharge or death.**

RESULTS: **There were 166 perinatal deaths (106 stillbirths and 60 perinatal deaths) out of the 2042 live and stillbirths during the study period(%). The perinatal mortality rate was 81 per 1000 live and stillbirths with a stillbirth rate of 52 per 1000 live and stillbirths and an early neonatal mortality rate of 31 per 1000 livebirths. Among the stillbirths, fresh stillbirths predominated over macerated stillbirths (1.4:1). Severe perinatal asphyxia was the most important cause of death in all birthweight categories except in extremely low birthweight babies were immaturity was more important. Prolonged labour was responsible for 42.6 % of those with severe perinatal asphyxia.**

CONCLUSIONS: **There is an urgent need to improve the monitoring of women in labour to reduce the prevalence of prolonged obstructed labour and increase capacity to provide essential newborn care. There is also need to improve on capacity and facilities for the management of babies with severe perinatal asphyxia and prematurity. WAJM 2012; 31(2): 102–108.**

Keywords: **Pattern, perinatal, mortality, Ilorin, Nigeria.**

RÉSUMÉ

CONTEXTE: La mortalité péri natale demeure un aspect important de la mortalité chez les enfants de moins de 5 ans, représentant plus de 20% de la mortalité dans cette tranche d'âge au Nigeria.

OBJECTIFS: Déterminer les aspects de la mortalité péri natale à l'Hôpital Universitaire d'Ilorin, Ilorin.

METHODES: Il s'agit d'une étude prospective conduite à l'Hôpital Universitaire d'Ilorin. Les données concernant les caractéristiques socio biologiques, anténatales et péri partum de 1969 femmes enceintes ont été recueillies sur une période de 7 mois (Avril 2006-Octobre 2006). Les données sur les 2042 bébés nés ont aussi été recueillies et ces bébés ont été suivis jusqu'à l'exéat ou le décès.

RESULTATS: Nous avons trouvé 166 décès en péri natal (106 mort-nés et 60 décès en péri natal) parmi les 2042 vivants et mort nés durant la période d'étude (%). Le taux de mortalité péri natale était de 81 pour 1000 naissances vivantes et mort-nées avec un taux de mort-nés de 52 pour 1000 naissances vivantes et mort-nées et un taux de mortalité néonatale précoce de 31 pour 1000 naissances vivantes. Parmi les mort-nés, les mort-nés frais prédominaient sur les mort-nés macérés (1.4:1). Une asphyxie périnatale sévère était la plus importante cause de décès chez toutes les catégories de poids excepté les bébés à très petits poids de naissance où l'immaturité était plus importante. Le travail prolongé était responsable pour 42.6 % des cas d'asphyxie périnatale sévère.

CONCLUSIONS: Il y'a un besoin urgent d'améliorer le monitorage des femmes en travail pour réduire la prévalence des dystocies et augmenter la capacité à fournir les soins essentiels aux nouveaux nés. Il est aussi nécessaire d'améliorer les capacités et équipements pour la prise en charge des bébés présentant une asphyxie périnatale sévère et une prématurité. **WAJM 2012; 31(2): 102–108.**

Mots clés: caractéristique, périnatal, mortalité, Ilorin, Nigeria.

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Abbreviations: **AGA**, Appropriate for Gestational age;**APH**, Antepartum Haemorrhage; **EBT,** Exchange Blood Transfusion; **ELBW**, Extreme Low Birth Weight; **ENMR,** Early Neonatal Mortality Rate; **HIE,** Hypoxic Ischaemic Encephalopathy; **HIV,** Human Immunodeficiency Virus; **LBW,** Low Birth Weight; **LGA,** Large for Gestational Age; **MDG,** Millenium Development Goals; **NEC,** Necrotizing Entero-Colitis; **NICU,** Neonatal Intensive Care Unit; **PI,** Principal Investigator; **PMR,** Perinatal Mortality Rate; **SBR,** Still Birth Rate; **SGA,** Small for Gestational Age; **SPA,** Severe Perinatal Asphyxia; **VLBW,** Very Low Birth Weight; **WHO,** World Health Organization.

INTRODUCTION

As part of the Millennium Development Goals (MDGs) many countries have set reduction of under-five mortality, as one of their key developmental goals.[1] To achieve this objective, perinatal mortality, which is responsible for a little over 20% of all under-five mortality, must be reduced. This is because though some progress has been made to reduce deaths after the first month of life (the post-neonatal period), there has been no measurable progress in reducing neonatal deaths over the past decade, especially perinatal . . . . . .[2] These deaths result mainly from obstetric and neonatal complications that can be prevented with proper antenatal and essential newborn services. Others are a consequence of neonatal problems that can be managed where quality supportive neonatal care is available.[3] In designing interventions/ strategies to reduce perinatal mortality in a given locality, it is important to know its pattern in that locality.

The World Health Organisation (WHO) estimated the worldwide perinatal mortality rate (PMR) for the year 2004 as 43 per 1000 births (stillbirth rate (SBR) of 22 per 1000 births and early neonatal mortality rate (ENMR) of 21 per 1000 births) with the less developed regions of the world accounting for 98% of these mortalities (PMR 47 per 1000 births; SBR 24 per 1000 births and ENMR 23 per 1000 births).[3] Africa contributed 32% of these peri-natal deaths (PMR 56 per 1000 births; SBR 28 per 1000 births and ENMR 29 per 1000 births) and West Africa has the highest rate in the African region (PMR 69 per 1000 births; SBR 36 per 1000 births and ENMR 34 per 1000 births).[3]

In Nigeria, of the estimated 5.3 million babies born in the year 2004, there were an estimated 425 000 perinatal deaths with a PMR of 76 per 1000 births, a SBR of 43 per 1000 births and ENMR of 35 per 1000 births.[3] Njokanma et al reported a perinatal mortality rate of 119.9 per 1000 deliveries in a hospital-based study from Sagamu, Nigeria.[4] Ekure et al at the Lagos University Teaching Hospital and Owa et al in Ilesa have also reported hospital based peri-natal mortality rates of 84.8 and 57.8 per 1000 births respectively.[5, 6]

These deaths are a result of maternal, socio-economic and foetal factors. Maternal factors include poor maternal nutrition, maternal illnesses like diabetes mellitus in pregnancy[7], HIV infection,[8-9] teenage pregnancy,[10] cord prolapsed,[11] preeclampsia,[12] mal-presentation,[13] and obesity.[14] Socio-economic factors include low socio-economic status, illiteracy, early child bearing, poor child spacing and harmful practices like poor cord care and uvulectomy.[3] Neonatal factors include macrosomia, severe birth asphyxia, prematurity, anaemia, neonatal jaundice and neonatal infections.[15] In some series, low birth weight contributes to 60% of these deaths.[16–17] Other neonatal causes of deaths are tetanus, congenital malformations, and intrauterine infection.[18] About 5–10% of foetal deaths are unexplained.[3]

While it is likely that the pattern in Ilorin, Nigeria, will be similar to those observed in earlier studies mentioned, this has not been documented. This study therefore aims to document the pattern of perinatal deaths at the University of Ilorin Teaching Hospital.

SUBJECTS, MATERIALS AND METHODS

The study was conducted at the Maternity Hospital Wing of the University of Ilorin Teaching Hospital, Ilorin, Nigeria. This wing of the hospital provides secondary and tertiary healthcare services in neonatology, obstetrics and gynaecology. In obstetrics, it attends to both booked and unbooked cases. The neonatal intensive care unit (NICU) provides level II care to both inborn and out born neonates. It admits between 1000 and 1200 patients annually. It does not have facitilies for ventilation. The histopathology department of the hospital has only basic gross microscopy facilities and is poorly equipped for detailed perinatal autopsy.

This was a prospective cohort study. The minimum sample size for the study was estimated using the formula

$$n = \frac{z^2pq}{d^2}$$

For the purpose this study, sample size estimation was based on estimated perinatal mortality in Nigeria for the year 2004 (7.6%) and a tolerable margin of error of 5%. The calculated minimum sample size was 108 perinatal deaths. Allowing an attrition rate of 10%, a total of 119 perinatal deaths were to be recruited into the study.

The study was conducted between April 2006 and October 2006. Subjects were recruited consecutively until the desired sample size was achieved. All deliveries during the study period were recorded consecutively. They were then grouped into alive, fresh still birth, macerated still birth and early neonatal death. Those discharged were followed up for at least one week. Babies of care givers that refused consent and those that withdrew consent were excluded from the study.

A structured study proforma was administered on all subjects recruited. Data on maternal profile collected included maternal age, tribe, height, parity, antenatal status, ante-partum haemorrhage, previous preterm delivery, previous abortion and drug intake during pregnancy. Data on weight at first antenatal care visit, packed cell volume and pregnancy induced or associated hypertension was obtained from the mother's hospital records. Socio-economic index scores were awarded to the subjects based on the occupations and educational attainments of their parents or caregivers using the Oyedeji socio-economic classification scheme. [19]

Babies were recruited immediately following birth. Apgar scoring was done at one and five minutes by the Paediatric resident responsible for the care of the baby immediately after birth. For those with a score below 7, an extended Apgar score was done at intervals of 5 minutes up to 20 minutes or until the child attained a score of 7, whichever occurred first while resuscitation continued. A detailed history of the pregnancy was obtained from the mother. A thorough examination was done on all recruited subjects by the principal investigator (PI) or a trained senior resident assisting the PI. The umbilical cord stump was examined for abnormal number of vessels. The gestational age for live born babies was estimated using the Ballard score. For babies that were dead, it was estimated using the last menstrual date of the mother if available. For those not

available, an ultrasound report, if available, was used. The weight was measured with the baby nude using a bassinet spring weighing scale (Waymaster). The scale was adjusted to zero before the baby was weighed. The weight was measured to the nearest 50g. For uniformity during the study period, the scale was checked for accuracy with a standard weight every week. The length was measured with an infantometer. With the child supine on a flattened firm surface, an assistant put the feet together and held them against a fixed foot piece. He straightened the back and the head was aligned to form a continuous longitudinal line with the back and lower limb. The feet were placed at right angle to the leg at the zero mark. A movable head piece was placed firmly against the vertex and the readings were measured to the nearest 1cm. The occipito- frontal circumference was measured with a non stretchable tape measure. The measurement was taken at the maximum point of occipital protuberance posteriorly and at a point one inch above the glabellar anteriorly. The measurement was taken to the nearest 1cm. With an odd shaped or an abnormally large head, the maximum size of head circumference was obtained. All the measurements obtained were plotted on a Lubchenco chart.[20] The baby was then appropriately classified as LGA (large for gestational age), AGA (appropriate for gestational age), or SGA (small for gestational age). The respiratory rate, heart rate and temperature were recorded. Congenital anomalies identified were documented. All babies that were ill were admitted in the neonatal intensive care unit. They were fully investigated and managed as per standard protocol depending on symptomatology and diagnosis. Morbidities encountered like sepsis, anaemia, apnoea, necrotizing entero-colitis, respiratory distress, asphyxia and jaundice were recorded. Relevant details of clinical course were recorded. Babies discharged during the perinatal period were followed up for at least one week. Phone numbers of caregivers were obtained and those that failed to show up for follow up were contacted. Autopsy was performed on those that died and in stillbirths. Postmortem examination and verbal autopsy was used to determine cause of death for those that refused consent. Outcome of those that refused admission was determined using residential address and phone number.

Data Analysis

Data from the proforma were entered into personal computer using SPSS version 15.0 for windows software. The data was cleaned before analysis. Frequency distribution tables for variables were generated. Outcome of preterm babies was determined. Morbidities encountered among preterm babies were cross tabulated and significance worked out. Chi- square test (with Yates correction where applicable) and Fisher's exact test were used to test for significance of the differences between categorical variables. Student 't' test and Mann Whitney U test were applicable were used for continuous variables. Level of significance was put at 0.05.

RESULTS

A total of 1969 women delivered 2042 babies over the 7-month period. Of these 1936 were livebirths. Of these, 1598 (81.2%) delivered at term, 222 (11.3%) delivered preterm and 109 (5.5%) delivered postterm. One thousand four hundred and seventy six (75.0%) of the women were booked at the UITH, 446 (22.7%) were booked elsewhere and 47 (2.3%) were unbooked. One thousand eight hundred and ninety eight (96.4%) of the pregnancies were singleton, 69 (3.5%) were twin pregnancies and 2 (0.1%) were triplet pregnancies. One thousand six hundred and twenty (82.3%) of the women had spontaneous vaginal deliveries, 44 (2.2%) had assisted vaginal deliveries while 304 (15.4%) had operative deliveries. One delivered the first twin vaginal while the second twin was delivered operatively. There were 1018 males and 1018 females. Six were of indeterminate sex. The male to female ratio was 1:1.

Outcome of all Babies Delivered

The outcome of all babies delivered is shown in Table 1. One thousand eight hundred and seventy six babies (91.9%) were alive after seven days while 60 (2.9%) died during the early neonatal period. Sixty two babies (3.0%) were fresh stillbirth and 44 (2.2%) were macerated stillbirth.

The perinatal mortality rate was thus 81 per 1000 live and stillbirths. The stillbirth rate was 52 per 1000 live and stillbirths. The early neonatal mortality rate was 31 per 1000 livebirths.

Table 2 show the causes of death among the 166 perinatal deaths that occurred during the study period. Severe Perinatal Asphyxia (SPA) was the predominant cause of death (48%). Twenty four percent were unexplained. Congenital malformations, immaturity and sepsis were responsible for 4%, 9% and 9% respectively. Jaundice and necrotizing enterocolitis were responsible for 1.2% and 1.8% of the remaining deaths respectively. This was depicted pictorially in Figure 1.

Table 3 shows those causes of death that remained significant after logistics regression to exclude confounders. After regression analysis, only sepsis became insignificant as a cause of perinatal death. The model accounted for 30% of perinatal deaths. Apnoea was the strongest determinant of perinatal death.

Table 1: Delivery Outcome

Outcome	Baby I	Baby II	Baby III	Total (%)
Alive	1820	55	1	1876(91.9)
Early Neonatal death	52	7	1	60(2.9)
Fresh Stillbirth	55	7	–	62(3.0)
Macerated Stillbirth	42	2	–	44(2.2)
Total	**1969**	**71**	**2**	**2042(0.0)**

Baby I were all the products of singleton pregnancies and the first of products of multiple gestations. Baby II were second of products multiple gestations (twin and triplet pregnancies) while Baby III were the third of products of triplet gestations.

Table 2: Causes of Perinatal Deaths

Cause	PD (%)	Alive (%)	OR (95% CI)	P value
Severe perinatal asphyxia				
Yes	43(51.8)	40(48.2)	138.34(65.84–295.44)	0.000#
No	13(0.8)	1673(99.2)		S
Sepsis				
Yes	11(23.9)	35(76.1)	12.26(5.46–27.14)	0.000#
No	43(2.5)	1678(97.5)		S
Apnoea				
Yes	23(92.0)	2(8.0)	634.73(142.91–5629.13)	
No	31(1.8)	1711(98.2)		0.000#S
Polycythaemia				
Yes	2(28.6)	5(71.4)	13.14(1.22–82.15)	0.017#
No	52(3.0)	1708(97.0)		S
Anaemia				
Yes	1(11.1)	8(88.9)	4.02(0.09–30.87)	0.244#
No	53(3.0)	1705(97.0)		NS
Respiratory Distress				
Yes	45(24.3)	140(75.7)	56.18(25.81–126.13)	0.000*
No	9(0.6)	1573(99.4)		S
Jaundice				
Yes	5(10.0)	45(90.0)	3.78(1.12–10.09)	0.016#
No	49(2.9)	1668(97.1)		S
Hypoglycaemia				
Yes	0(0.0)	12(100.0)	0.00(0.00–11.67)	0.688#
No	54(3.1)	1701(96.9)		NS
Congenital Malformations				
Yes	8(80.0)	2(20.0)	50.19(9.84–486.79)	0.000#
No	148(7.4)	1857(92.6)		S

**Chi square test; S Significant; # Fisher's Exact test; NS not significant*

Table 3: Linear Logistic Regression of causes of Perinatal Deaths

	Beta Coefficients	T	P value
Severe perinatal asphyxia	0.283	13.420	0.000
Sepsis	0.029	1.709	0.088
Apnoea	0.438	24.115	0.000
Polycythaemia	0.075	4.732	0.000
Respiratory distress	0.106	5.284	0.000
Jaundice	–0.041	–2.393	0.017
Congenital malformations	0.138	8.721	0.000

Table 4 shows the various causes of severe perinatal asphyxia. Prolonged labour was responsible for 42% of them. Other causes were antepartum haemorrhage (18%), pregnancy induced hypertension (17%), postterm (8%), prematurity (8%), prolonged second stage (3%), cord accidents (3%) and severe anaemia (1%). The major causes are depicted graphically in Figure 2.

Table 5 shows the cross tabulation of stages of severe perinatal asphyxia with perinatal death. Seventeen (89.5%) of the 19 babies that died due to severe perinatal asphyxia had stage III hypoxic ischaemic encephalopathy.

Table 6 shows the contribution of severe perinatal asphyxia to deaths among extreme low birthweight infants. Eight (72.7%) of the 11 extreme low birthweight babies that died had severe birth asphyxia.

Wigglesworth Classification of All Perinatal Deaths

There were 166 perinatal deaths during the study period. Stillbirths were almost twice as frequent (63.9%) as early

Table 4: Causes of Severe Perinatal Asphyxia

Cause of severe perinatal asphyxia	No (%)
Prolonged Labour	34(42.6)
Malpresentation	17(21.3)
Macrosomia	6(7.5)
Ruptured uterus	6(7.5)
Hand prolapse	3(3.8)
Leg prolapse	1(1.3)
Retained second twin	1(1.3)
Pregnancy induced hypertension	14(17.5)
APH	15(18.8)
Abruption placentae	10(12.5)
Placenta praevia	5(6.3)
Post-term	6(7.5)
Prematurity	6(7.5)
Prolonged second stage	2(2.5)
Cord accidents	2(2.6)
Cord around the neck	1(1.3)
Cord prolapse	1(1.3)
Severe anaemia	1(1.3)
Total	**80(100.0)**

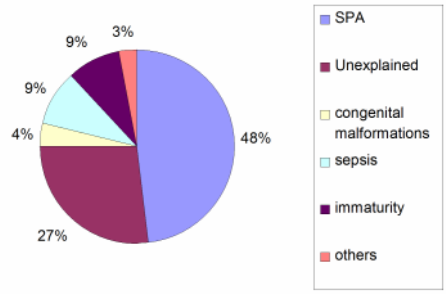

Fig. 1: *Causes of Death among 166* Babies

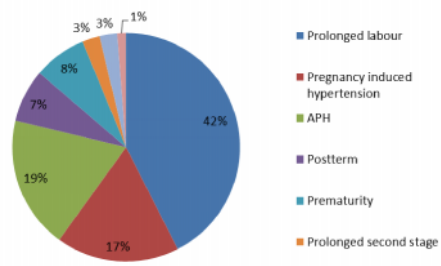

Fig. 2: Causes of Severe Perinatal Asphyxia

Table 5: Cross Tabulation of Stages of Severe Perinatal Asphyxia and Perinatal Death

	Perinatal Death	Alive	Total	X-square Test
HIE III	17	1	18	0.000
HIE II	2	4	6	With Yates
HIE I	0	3	3	Correction
Total	**19**	**8**	**27**	

Table 6: Contribution of Severe Perinatal Asphyxia to Death among Extreme Low Birthweight Babies

Severe Perinatal Asphyxia	Perinatal Death	Alive	Total	Fisher's Exact Test
Yes	8	0	8	
No	3	2	5	0.182
Total	**11**	**2**	**13**	

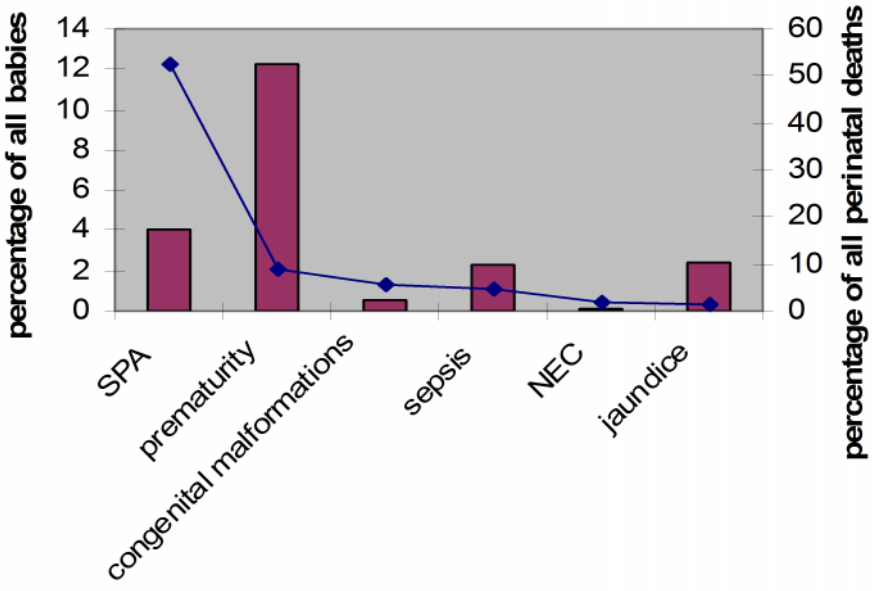

Fig. 3: Contribution of Causes of Death to Perinatal Morbidity and Mortality

neonatal deaths (36.7%). Fresh stillbirths predominated over macerated stillbirths (1.4:1). The majority (86.7%) of perinatal deaths were due to severe perinatal asphyxia (52.4%), normally formed macerated stillbirths (25.3%) and immaturity (9%).

Analysis of cause of death by birthweight shows that severe perinatal asphyxia was the most important cause of death in all birthweight categories except in the extremely low birthweight babies were immaturity was more important as shown in Table 7.

Figure 3 shows the contribution of the various causes of death to perinatal mortality.

DISCUSSION

This study has demonstrated that perinatal mortality is a significant problem in Ilorin. All the parameters were higher than the 2004 estimate of Nigeria with a PMR of 76 per 1000 births, a SBR of 43 per 1000 births and ENMR of 35 per 1000 births.[3] These estimates were based on extrapolation from the incomplete vital registrations and studies that were usually hospital based. This will not give a true estimate of perinatal mortality rate as the absolute number of babies delivered alive and dead will be under-reported. Our rate is also higher than will be expected from a community based study because the study centre is a tertiary centre that attends to referrals from other primary and secondary centres. Most normal deliveries are taken in these primary and secondary centres while the complicated ones are referred to the teaching hospital. This reduces the denominator and thus exaggerates the perinatal mortality rate.

Table 7: Wigglesworth Classification of Perinatal Mortality by Birthweight

	ELBW	VLBW	LBW	Normal	Macrosomia	Unspecified	Total
SPA	1(8.3)	10(52.6)	16(44.4)	32(59.3)	10(71.4)	18(58.1)	87(52.4)
Immaturity	10(83.3)	5(26.3)	–	–	–	–	15(9.0)
NFMSB	1(8.3)	3(15.8)	8(22.2)	15(27.8)	4(28.6)	11(35.5)	42(25.3)
Cong Mal	–	–	4(11.1)	3(5.6)	–	2(6.5)	9(5.4)
Others							
Sepsis	–	–	5(13.9)	3(5.6)	–	–	(4.8)
NEC	–	–	3(8.3)	–	–	–	83(1.8)
Jaundice	–	1(5.3)	–	1(1.9)	–	–	2(1.2)
Total	**12(7.2)**	**19(11.4)**	**36(21.6)**	**54(32.5)**	**14(8.4)**	**31(18.7)**	**166(100.0)**

Our results are comparable to reports from other centres in Nigeria. Ekure *et al*[5] reported a rate of 84.8 per 1000 births in Lagos while Njokanma *et al* in Sagamu reported a higher figure of 119.9 per 1000 deliveries.[4] This is possibly a result of progress made by various countries, Nigeria inclusive, in various mortality data towards the attainment of the millennium development goals (MDGs). Owa *et al* however had a lower rate of 57.8 per 1000 births from Ilesa.[6] All these values are very high compared to those from more developed countries (PMR 7 per 1000 births; SBR 4 per 1000 births and ENMR 3 per 1000 births).[3]

Severe perinatal asphyxia (SPA) is known to be an important cause of perinatal death.[4,5,21–23] It was the leading cause of perinatal death in this study, being responsible for 52.4% of all perinatal deaths. It was the most important cause of death in all weight groups except the extreme low birthweight babies (ELBW). Even among the ELBW, SPA was a secondary problem in 72% of those that died. Prolonged labour, pregnancy induced hypertension, macrosomia, ruptured uterus, placental abruption, postterm and preterm deliveries were responsible for more than 80% of all cases of SPA that died. More than eighty percent (89.5%) of those that died of SPA had SPA with stage III HIE. The remaining 10.5% had stage II HIE.

Whether acquired by the fetus in utero or by the infant at birth or in early postnatal life, neonatal sepsis is an important cause of perinatal mortality. Though it was responsible for 9% of all perinatal deaths in this study, it was not significant after logistic regression analysis as an important morbidity resulting in death when compared to the number of babies admitted with neonatal sepsis. There was no significant association with either premature or preterm rupture of membrane. There was also no significant association with chorioamnionitis. This could be due to the use of broad spectrum antibiotics immediately a baby with risk for sepsis is admitted into the nursery.

Though five babies that died perinatally in this study had jaundice, it was the primary cause of death in only two. One was a VLBW infant and the other a normal birthweight infant. The two had EBT performed before their death.

Congenital malformations were also an important cause of death in this study. Of those with malformations, 80% died. Eight babies died due to lethal congenital malformations. Four died in the early neonatal period. There were one case each of gastroschisis with abnormal genitalia, congenital talipes equinovarus deformity with polyhydramnios, Edward syndrome and an unidentified syndrome. All had significant complex congenital cardiac malformations at postmortem. There were 2 cases of anencephaly, 1 with congenital hydrocephalus and another with renal and pulmonary hypoplasia with ascites and double umbilical cord among the stillbirths.

Necrotizing enterocolitis (NEC) is a major cause of perinatal mortality It accounts for up to 15% of all deaths in neonatal intensive care units and 40% of infants that develop NEC die.[23] It was the cause of death in 3 LBW babies. All the 3 had SPA as a predisposing factor.

Forty four (41.5%) of the stillbirths were unexplained. Twenty three stillbirth babies had postmortem in this study out of whom 10 (22.8%) were among the unexplained ones. Though there is little doubt that a full autopsy carried out by a perinatal pathologist and supported by standard techniques remains the best method of investigating and identifying the cause of a perinatal death, the postmortem examination only revealed the cause of death in one of the unexplained stillbirths in our own study. The ability of postmortem examination to reveal the cause of death depends on facilities available to undertake a standard procedure. Most of these facilities are not available in our facility. Other studies have shown the link between standardization of perinatal postmortem and identification of cause of death.[24-25] Though some previous workers from Nigeria have reported better autopsy rates than reported in our study, there are reports of declining autopsy rates for investigation of perinatal deaths in many studies.[5,26–27]

This study supports the findings of a high perinatal mortality rate in Nigeria. It also highlights the role of severe perinatal asphyxia in perinatal mortality. The causes of severe perinatal asphyxia highlight the urgent need for an improved and a focussed antenatal care of all pregnant women at all tiers of health care delivery to reduce the menace of perinatal death.

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