

Original Article

PREVALENCE OF MACROSOMIA AND ASSOCIATED COMPLICATIONS AS SEEN IN A NEONATAL UNIT OF A TERTIARY HOSPITAL IN SOUTH EASTERN NIGERIA.

Daniyan OW^{1*}, Ezeanosike OB^{1,2}, Obu DC¹, Onwe OE^{1,2}, Asiegbu UV^{1,2}, Joe-Akunne CI¹

¹Department of Paediatrics, Alex Ekwueme Federal University Teaching Hospital, Abakaliki Ebonyi State, Nigeria

²Department of Paediatrics, Ebonyi State University, Abakaliki, Ebonyi State, Nigeria

*Correspondence: Dr. Olapeju Wunmi Daniyan; daniyanolapeju@gmail.com

Abstract

Background: Macrosomia contributes to neonatal morbidity and mortality. Macrosomic birth is associated with an increased need for caesarean section or instrumental deliveries and neonatal resuscitation.

Objective: This study aims to determine the prevalence of macrosomia and associated complications among neonates admitted into a newborn unit in South Eastern Nigeria.

Materials and Methods: It was a 3-year retrospective descriptive study, carried out at the Newborn Special Care Baby Unit of Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Nigeria, between 1st May, 2016 and 30th April, 2019. Admission files of all babies with birth weight $\geq 4000\text{g}$ were retrieved for information including birth weight, length, head circumference, mode of delivery and duration of hospital stay. Maternal parity, maternal age, gestational age, history of previous delivery of a macrosomic baby and complications observed during pregnancy were also recorded in a proforma. Data obtained were analysed using SPSS version 22.

Results: A total of 1133 babies were admitted during the study period, of these, 74 babies were macrosomic giving a prevalence of 6.5%. Most (66.2%) of the babies were males and fifteen (20.3%) of the mothers had a history of diabetes mellitus. The commonest complication was birth trauma.

Conclusion: Macrosomia contributes to neonatal morbidity, therefore adequate monitoring during antenatal care and during delivery of both mother and baby should be done to reduce neonatal complications.

Keywords: Newborn, Macrosomia, Birth weight, Prevalence, Complications.

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INTRODUCTION

Macrosomia is defined as a birth weight $\geq 4000\text{g}$.¹ The condition is associated with both maternal and perinatal complications. Prevalence of macrosomia varies based on population. It affects 6-10% of all newborns.² In Africa various prevalence rate have been reported such as 6.9% in Nigeria,³ 10.1% in Algeria⁴ and 19.1% in Ethiopia.⁵ The diagnosis of macrosomia is made on delivery of the neonate, though suspicion of fetal macrosomia can be made by ultrasonography and clinical examination of the mother in pregnancy.

The risk factors for macrosomia include increased pre-pregnancy body mass index, history of previous delivery of

a macrosomic baby, advanced maternal age, maternal weight gain $\geq 16\text{kg}$, male sex, and post term pregnancy.^{5,6,7} Macrosomic birth is associated with increased need for caesarean section or instrumental deliveries and neonatal resuscitation. Complications of fetal macrosomia include birth trauma, polycythemia, respiratory problems and meconium aspiration.^{1,8,9} Macrosomia is also associated with increased risk of overweight and obesity in later life.¹⁰ Macrosomia contributes to neonatal mortality and morbidity and this risk increases with increasing birth weight.¹¹ Adequate supervision of at-risk mothers in pregnancy and during delivery is essential to reduce complications associated with macrosomia.

This study aims to determine the prevalence of macrosomia and associated complications among neonates admitted in Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Nigeria.

MATERIALS AND METHODS

This was a retrospective descriptive study carried out at the Newborn Special Care Baby Unit (NBSCU) of Alex Ekwueme Federal University Teaching Hospital Abakaliki, Nigeria between 1st May, 2016 and 30th April, 2019. The Newborn unit has both an in-born and out-born section and a Neonatal Intensive Care Unit (NICU). The unit receives referrals from peripheral and private hospitals. The members of staff of the unit consist of consultant Neonatologists and other specialists, Paediatric residents and Nurses.

Macrosomia was defined as a birth weight $\geq 4000\text{g}$ and all macrosomic babies admitted into the NBSCU within the study period were included in the study. The admission files of all babies with birth weight $\geq 4000\text{g}$ admitted into the NBSCU during the study period were retrieved. Information obtained included newborn characteristics like birth weight, length, head circumference, mode of delivery and duration of hospital stay. Maternal characteristics like maternal parity, maternal age, gestational age, history of previous macrosomic baby and complications observed during pregnancy were recorded in a proforma. Data was analyzed using SPSS version 22. Newborn and maternal characteristics were presented in frequency tables and complications associated with macrosomia were presented graphically.

RESULTS

A total of 1133 babies were admitted during the study period, of these, 74 babies were macrosomic. The prevalence of macrosomia was 6.5%. The mean weight of the babies was $4.28 \pm 0.29\text{kg}$ and the mean length was $51.12 \pm 2.9\text{cm}$. Forty-nine (66.2%) of the babies were males, while 63 (85.1%) of the babies weighed between 4.0 and 4.5 Kg. Fifty-four (73.0%) of the babies were delivered through emergency caesarean section as shown in table 1.

Forty-one (54.4%) of the mothers were within the age range of 25 and 34 years. Fifteen (20.3%) of them had a history of diabetes mellitus, while only 8 (10.8%) had a previous history of birth of a macrosomic baby as shown in table 2.

The commonest complication was birth trauma, while the least complication was meconium aspiration syndrome, this is shown in figure 1. Over 90 % of the babies were discharged within one week of admission in the hospital and no death was recorded among the babies.

Table 1: Newborn characteristics

Newborn characteristics	Frequency (%) N= 74
Gender	
Male	49 (66.2)
Female	25 (33.8)
Weight	
4.0-4.5	63 (85.1)
>4.5	11 (14.9)
Mode of delivery	
Spontaneous Vertex Delivery	20 (27.0)
Caesarean Section	54 (73.0)
Duration hospital stay	
1-2	60 (81.1)
3-7	11 (14.9)
>7	3 (4.0)

Table 2: Maternal characteristics

Maternal characteristics	Frequency (%) N= 74
Maternal age	
15 – 24	6 (8.1)
25 – 34	41 (55.4)
35 – 44	27 (36.5)
Parity	
1	15 (20.3)
2 – 4	44 (59.4)
>5	15 (20.3)
Diabetes mellitus	
No	59 (79.7)
Yes	15 (20.3)
Gestational age	
37 – 39	56 (75.7)
40 – 42	18 (24.3)
Previous macrosomic baby	
No	66 (89.2)
Yes	8 (10.8)

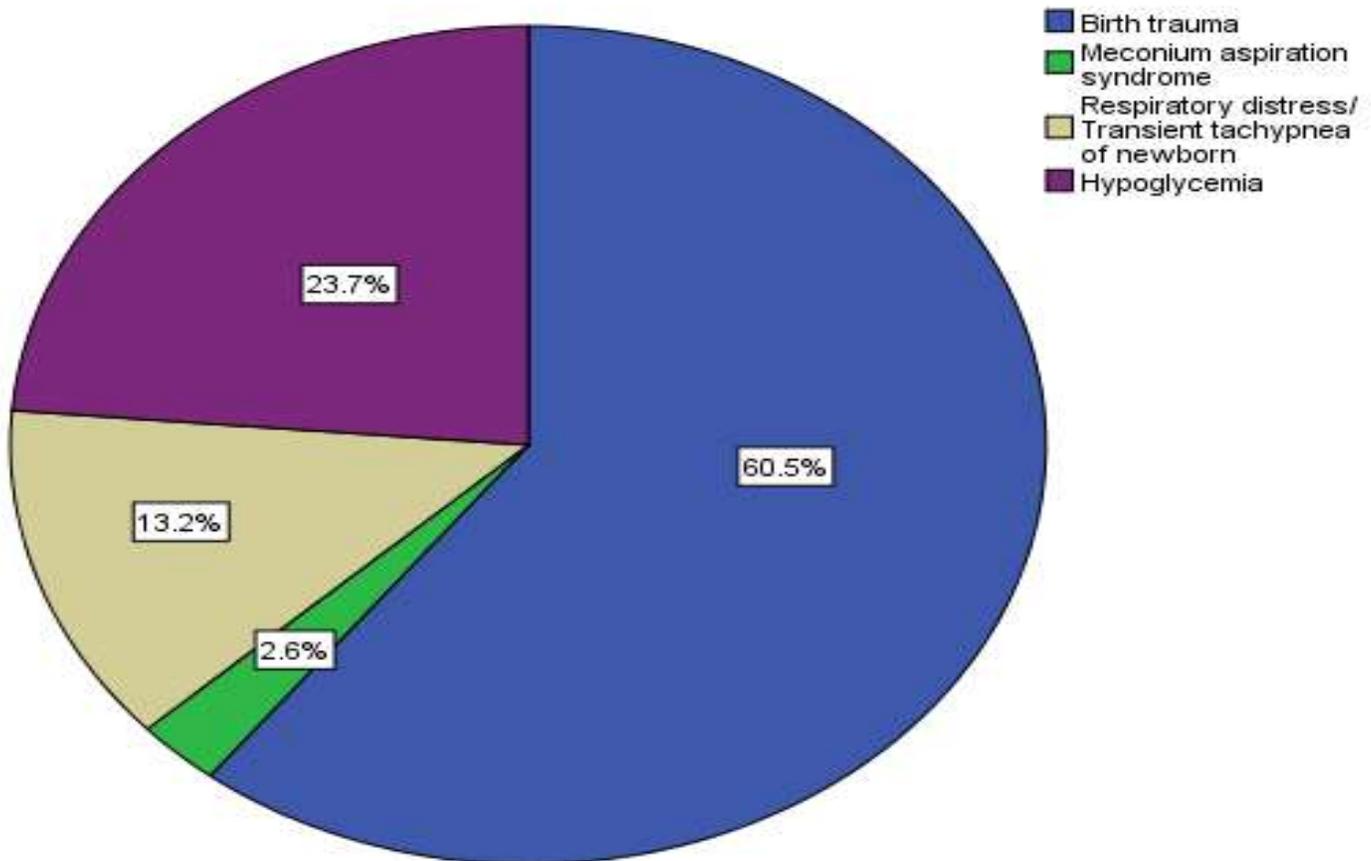


Figure 1: Complications observed among macrosomic babies

DISCUSSION

The prevalence of macrosomia in this study was 6.5%. In Nigeria similar prevalence rates have been reported which include 8.1% in Enugu,¹² 5.5% in Benin,¹³ and 7.4% in Port Harcourt.¹⁴ In Ethiopia, a prevalence of 7.5% was reported,¹⁵ while in the USA, national vital statistics report in 2015 gave a prevalence of 7% for newborns weighing >4.0 kg.¹⁶

In this study, macrosomia was commoner amongst the male babies. Findings of male preponderance has also been reported by other authors.^{12,17} Adugna et al also found that male newborn were 3.6 times more likely to be macrosomic than the female ones.¹⁵

A significant number of the macrosomic babies were delivered through caesarean section compared to vaginal delivery in this study. This is similar to that reported by Akindele et al,¹⁷ where 67% of macrosomic babies were delivered through caesarean section, although a lower rate

of 40.9% was reported by Cheng et al,²¹ while 27.3% was reported by Ezegwui et al.¹² The incidence of caesarean section has also been reported to be high among macrosomic babies compared to normal weight babies in other studies.^{18,19,20} The variations in the rates of Caesarean section reported in different studies may be due to variation in protocol for mode of delivery of macrosomic babies. Counseling on the likelihood of delivery by caesarean section in the preparation for delivery of women with suspected fetal macrosomia should be taken into consideration.

Most of the babies had short hospital stay because many of them were admitted for observation to identify the presence of complications associated with delivery of macrosomic babies like birth trauma and hypoglycemia. Tolosa et al²² reported an average duration of hospital stay of 8±6 days among macrosomic babies studied while Onankpa and Nauzo²³ reported a mean duration of

hospital stay of 1.85 days among macrosomic babies in Sokoto, North-West Nigeria.

Maternal diabetes mellitus has been shown to be a predisposing factor for fetal macrosomia.^{18,24,25,26} In this study, only about 20% of the babies were infants of diabetic mothers. This finding suggests that other factors contribute to fetal macrosomia. Other risk factors that have been associated with fetal macrosomia include maternal weight >80kg, white race, male infant, maternal age ranging between 30 and 39 years, multiparity and gestational age \geq 40 weeks.^{12,13 18,24} Previous delivery of a macrosomic baby is also a risk factor that has been reported to be associated with fetal macrosomia,^{5,17,25} though in this study only about 10% of mothers had a history of previous delivery of a macrosomic baby.

The commonest complication among the babies was birth trauma, most of which were soft tissue injuries like caput succedaneum and few cases of Erb palsy. The high incidence of birth trauma seen in this study may have resulted from prolonged obstructed labour or difficult deliveries. Hypoglycemia, birth trauma and perinatal asphyxia were common among macrosomic babies reported by Akindele et al.¹⁷ Over weight and obesity has also been reported as long-term consequences of macrosomia.²⁶

There was no death recorded among the babies in this study, similar to findings by Onakpa and Nauzo,²³ and could be as a result of good obstetric and neonatal care in the facility studied. Other studies have shown that there are more deaths among macrosomic babies compared with normal weight babies.^{3,13,18}

It is worthy of note that fetal macrosomia is associated with neonatal morbidity and mortality. Therefore, pregnant women should be encouraged to attend antenatal care for adequate monitoring and those who are at risk of fetal macrosomia should be monitored during pregnancy and in labour to reduce the incidence of complications associate with macrosomia.

CONCLUSION

The prevalence of macrosomia in this study is similar to that reported by other authors in Nigeria. Macrosomia can also occur among infants of non-diabetic mothers. Therefore, adequate monitoring during antenatal care and

delivery of mother and baby is important to reduce neonatal complications.

AUTHORS' CONTRIBUTIONS

OW Daniyan conceived the study, **OB Ezeanosike** designed the study, **OW Daniyan** and **DC Obu** collected the data and analyzed it, **OW Daniyan**, **OE Onwe**, **UV Asiegbu** and **CI Joe-Akunne** prepared the manuscript. All authors edited and approved the manuscript.

COMPETING INTERESTS

There are no competing interests.

ETHICAL APPROVAL

Ethical approval was not required for this study.

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