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A Rare Encounter of Fetal Macrosomia with Newborn Weighing Six Kilogram: A Case Report and Literature Review

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ABSTRACT

Fetal macrosomia generally occurs when the estimated weight of the fetus exceeds the expected threshold, irrespective of gestational age. It is defined as a fetus larger than 4000 to 4500 grams. Documented risk factors for macrosomia include maternal birth weight, gestational or preexisting Diabetes mellitus, obesity, age >35 years, excessive gestational weight gain, multiparity, male fetus, previous history of macrosomia and intrinsic fetal factors such as congenital, cytogenetic and other syndromic fetal abnormalities. We present a case of an unbooked 28-year-old woman who delivered a 6kg newborn in a fertility centre in Lagos.

INTRODUCTION

Macrosomia has been commonly defined by a birth weight of 4000g or 4500g [1,2]. It is defined based on absolute birth weight threshold unlike large for gestational age which is generally believed to be fetal weight more than 90th percentile or two standard deviation above the mean of gestational age [1,2]. The incidence of macrocosmic birth in Lagos, Nigeria was found to be 6.9% higher than a previous study of 4.9% in the same city. Until now it is generally believed that relationship exists between maternal glycaemic conditions and occurrence of fetal macrosomia. [3]. However, recent evidence suggests that both maternal and fetal factors synergistically play a significant role in fetal macrosomia. [1, 4, 5]. These factors include maternal and fetal hyperglycaemia, maternal dyslipidemia, fetal insulin, growth hormone, insulin-like growth factors and intrinsic fetal genetic composition. [2, 4]. These collectively lead to accelerated fetal fat deposition which invariably leads to increased fetal weight. Other things that have been fingered in recent literature include maternal inactivity, increased uteroplacental perfusion, large placenta size, increased transplacental concentration gradient, and exaggerated ability of the placental to transfer nutrients. These factors are particularly important irrespective of maternal glycaemic status. [2, 4, 5, 6].

Macrosomia, irrespective of the various diagnostic cut-off criteria is associated with increased risk of adverse perinatal morbidity and mortality and their delivery also puts the parturient at increased risks of morbidity and mortality [1,3,4,6]. The possible adverse perinatal outcome includes shoulder dystocia, brachial plexus injuries, hypoglycaemia, birth asphyxia, neonatal admission, respiratory complications, polycythaemia, congenital fetal anomalies, impaired glucose tolerance, metabolic syndrome, cardiac remodelling and even neonatal death [1,3,4,6].

Maternal complications mirrors those associated with cephalopelvic disproportion such as; prolonged labour, labour augmentation, operative deliveries (instrumental and/or caesarean section), sepsis, postpartum haemorrhage, anaesthesia exposure, poor progress of labour, instrumental vaginal delivery, increased caesarean rate, genital tract lacerations and uterine rupture. [1,3,4,6].

The cause can be unknown in some cases; however, some common consistent risk factors include maternal diabetes mellitus, maternal preconception obesity, previous macrocosmic delivery, multiparity, prolonged pregnancy, advanced maternal age, ethnicity and excessive pregnancy weight gain [1,3,4,6]. Preponderance of male fetal or neonatal gender is common, so also is births from Hispanic women compared to other races. [6]

CASE

Suzy (pseudonym) is a 28-year-old unbooked lady who presented to our facility on self-referral having declined elective caesarean section in another hospital. Pregnancy was unplanned but desired. She had a previous caesarean delivery of 4kg baby two years ago. On presentation, her estimated gestational age was 39 weeks 4 days. Her vital signs on presentation were SP02 of 97%, pulse rate of 100 beats per minute, BP of 220/120mmHg, dipstick urine showed 3+ proteinuria and generalized oedema. There was no headache, abdominal pain or visual disturbance. She weighed 120kg. Her samples were taken for full blood count, liver function test, Renal function, urinalysis, uric acid and group and save blood. Random blood sugar was 206mg/dl. She was not a known hypertensive, diabetic or asthmatic. Bedside ultrasound scan showed a single viable fetus in breech presentation with estimated fetal weight of 4.9kg and fetal heart rate of 148bpm. She had BP control with intravenous labetalol, she also had magnesium sulphate for seizure prophylaxis.

She subsequently had a caesarean section under spinal anaesthesia and was delivered of a live male neonate with a birth weight of 6kg. Baby had persistent hypoglycaemia needing intermittent correction within the first 36 hours after birth and needed close monitoring in the neonatal intensive care unit. Her post op recovery was uneventful, and she was discharged of 5th post operative day.

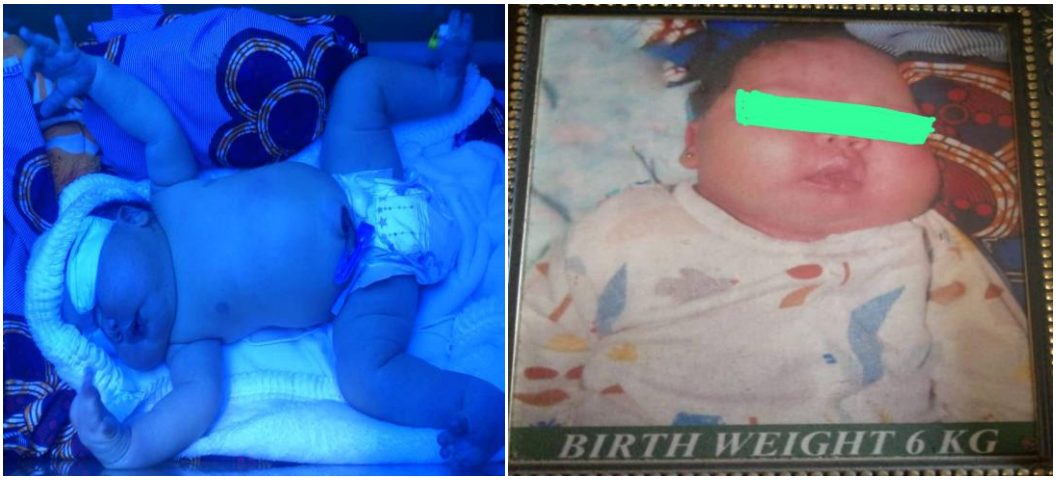

Image 1 & 2; 6kg macrosomic newborn at birth and 48 hours respectively.

DISCUSSION

The incidence of macrosomic birth in Lagos, Nigeria was found to be 6.9% higher than a previous study of 4.9% in the same city. [6]

The disparity over time was probably related to improvement in the socioeconomic standards, westernization of diets, increasing population of diabetics, increasing preconception and maternal body mass index associated with urbanization [1,3].

Multiparity is a documented risk factor for macrosomia [3,6,11]. Lifestyle changes associated with better living conditions explains increasing cases amongst primigravidas [3,11]. Male preponderance of macrosomic babies has been seen to be a more common finding [3,6,11].

Macrosomia comes with higher risk of emergency caesarean section related to cephalopelvic disproportion [1,3,4,6]. The same reason explains higher birth canal related injuries and fetal trauma when vaginal delivery is undertaken [1,4,12].

Macrosomic newborns are more likely to have less favourable indicators of newborn wellbeing such as 5th minuite Apgar score, pO2, pCO2 and arterial cord pH in favour of axphyxia [1]. Besides birth asphyxia, there is higher tendency for hypoglycaemic tendencies, fractures, congenital malformations and a general policy of lowered threshold for neonatal admission. The morbidity and mortality increases with progressive macrosomia [3,13,14].

Risk factors combination cannot accurately predict macrosomia for clinical application, Clinical attempts at perinatal diagnosis has also been prone to errors. The patient presented had a previous macrosomic birth, was of large body build with fetus of a male gender which are all documented risk factors for macrosomic birth. The best prenatal tool so far being ultrasound scans fetal weight estimation which largely is user dependent as was seen to be largely incorrect with the scan done by the patient on the same day of delivery. The definitive diagnosis made retrospectively after birth makes it challenging for decision making regarding optimal mode of delivery.

CONCLUSION

The incidence of fetal macrosomia increases in accordance with increasing risk factors occasioned by lifestyle changes. The consequence of such reflects in corresponding rise in overall adverse perinatal outcome and higher maternal morbidity and mortality occasioned by difficult labour. A lowered threshold for elective caesarean section improves neonatal outcome and reduces birth

related injuries to both mother and neonate. A high index of suspicion in anticipated cases, especially in the presence of risk factors and proper antenatal diagnosis by accurate ultrasound estimation of fetal weight is important for proper decision making on delivery options and preparation for neonatal challenges. Adequate knowledge of the challenges, complications and preparedness for macrosomia by the emergency obstetric and neonatal staff will help prevent and reduce impact of morbidity and mortality thereby promoting a healthy baby to a healthy mother at the end of pregnancy and delivery.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models
(ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

CONSENT

A written informed consent was obtained from the patient for publication of this case report.

CONFLICTS OF INTEREST

No conflict of interest declared.

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