Best Practice & Research Clinical Obstetrics and Gynaecology xxx (2018) 1–8

Contents lists available at ScienceDirect

Best Practice & Research Clinical Obstetrics and Gynaecology

journal homepage: www.elsevier.com/locate/bpobgyn

6

Monitoring fetal growth in settings with limited ultrasound access

Sikolia Z. Wanyonyi*, Steve K. Mutiso

Department of Obstetrics and Gynaecology, Aga Khan University, Nairobi, Kenya

Keywords:
Fetal growth
Gestational age
Low-resource settings
Ultrasound
Symphysio-fundal height

A B S T R A C T

Abnormal fetal growth significantly increases neonatal mortality and the risk of stillbirth. This creates the need for accurately monitoring fetal growth in all pregnancies regardless of the risk status. Several methods used in clinical practice include abdominal palpation, symphysio-fundal height measurements, and obstetric ultrasound. Of these, obstetric ultrasound remains the most reliable and objective way to monitor fetal growth. However, in most low-resource areas, access to obstetric ultrasound remains poor and this leaves the two as the only options available. This not only has effect on fetal growth monitoring but more importantly on the accuracy of pregnancy dating. To improve the current situation, we propose strategies for training of health workers, educating the public on importance of obstetric ultrasound, and improving access to basic equipment. However, interim solutions have to be implemented hand in hand with other strategies to ensure universal access to ultrasound technology for fetal growth monitoring.

Introduction

Abnormal fetal growth significantly increases the risk of perinatal morbidity and mortality. Indeed, the main risk factor for stillbirths at term in presumably low-risk pregnancies is the failure to identify growth-restricted or small-for-gestational age fetuses [1]. This makes it necessary to monitor fetal

* Corresponding author. Aga Khan University Hospital, PO BOX 30270-00100, Nairobi, Kenya.
E-mail address: Sikolia.wanyonyi@aku.edu (S.Z. Wanyonyi).

https://doi.org/10.1016/j.bpobgyn.2018.02.001
1521-6934/

growth in every pregnancy to identify fetuses at risk of death or severe morbidity [2,3]. Several methods for detecting fetal growth disorders exist in clinical practice. Simple techniques such as abdominal palpation and symphysio-fundal height (SFH) measurements have been widely accepted in clinical practice [4,5]. These methods may be suitable for straightforward low-risk pregnancies. However, whenever abnormal fetal growth is suspected, there is always a need for corroborating the findings using sonographically derived biometric measurements. This provides an objective, reliable, and reproducible assessment of fetal growth. In addition to determining fetal size, obstetric ultrasound also provides an opportunity to perform Doppler studies on key fetal vessels. This information could help differentiate pathologically growth-restricted from constitutionally small fetuses [6].

This is the "idealistic" approach to fetal growth monitoring. It may sound simplistic, but in actual practice, there are challenges surrounding the accurate identification of fetal growth disorders. This is especially true for resource-poor settings where access to obstetric ultrasound may be limited [7]. Unfortunately, these are the same regions that bear the greatest burden of stillbirths and perinatal morbidity [8], and lack of or limited access to obstetric ultrasound makes fetal growth monitoring difficult to achieve.

In this review, we explore the current practice of fetal growth monitoring in resource-poor settings. Based on available evidence, we have identified the key challenges and barriers to achieving the idealistic approach to fetal growth monitoring and gone further to suggest possible solutions (both interim and long term).

The current practice

Determining gestational age

Correct estimation of gestational age remains an integral component of quality prenatal care. It allows for proper scheduling of prenatal care, informs decision-making at different stages of pregnancy, and is key to correct interpretation of fetal growth parameters [9]. Inaccurate estimation of gestational age may therefore result in inappropriate interventions such as premature induction of labor or prolonged pregnancies [10]. In the absence of reliable estimation of gestation age, it is not uncommon to encounter situations where appropriately grown fetuses are erroneously labeled as small or large for gestational age or growth-restricted pregnancies allowed to progress, on the assumption that the dates were wrong.

However, accurate pregnancy dating remains a big challenge in most low-resource settings. This not only affects clinical care but also the performance and interpretation of research data in maternal and perinatal health. A case in point is the antenatal corticosteroids trial (ACT trial). In this study, birth weight centiles were used instead of gestational age to define prematurity, leading to mislabeling of most infants. This eventually affected the credibility and applicability of the results of an otherwise robust and well-executed study [11].

In low-resource settings, there is still much reliance on last menstrual period (LMP) for gestational age estimation [12]. The use of LMP to date pregnancy is based on the assumption that ovulation occurs on the 14th day of the menstrual cycle. However, certainty of the LMP is very low, with only 32% of women being sure of it [13]. In addition to this, the cycle length is influenced by many factors such as irregular menses, unknown or uncertain dates, recent pregnancy, or current breastfeeding, all affecting its accuracy [14]. It is now agreed that the use of Crown Rump Length (CRL) between 7 weeks 0 days and 13 weeks 6 days is a more reliable way to estimate gestational age [15]. The problem is that this critical measurement is not readily available in low-resource settings. This could be either due to unavailability of the ultrasound equipment or lack of trained expertise to perform a proper examination [16]. In addition to this, there are many late bookers in most resource-poor settings. When women present for prenatal booking visits in the second or third trimester, the use of ultrasound for gestational age determination is prone to error compared to first trimester dating [12,17].

With unreliable dating of the pregnancy, subsequent growth monitoring becomes difficult and inaccurate.

Please cite this article in press as: Wanyonyi SZ, Mutiso SK, Monitoring fetal growth in settings with limited ultrasound access, Best Practice & Research Clinical Obstetrics and Gynaecology (2018), https://doi.org/10.1016/j.bpobgyn.2018.02.001