Trends in reporting third trimester ultrasound

in Australia and New Zealand

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Introduction

Abnormal fetal growth and fetal growth restriction (FGR) in particular, is associated with increased risk of adverse perinatal outcomes[1,2]. Prenatal identification allows for increased fetal monitoring to inform clinical decisions regarding delivery, and has been shown to improve perinatal outcomes[3].

The role of ultrasound in the measurement of fetal biometry, estimation of fetal weight and Doppler assessment of fetal haemodynamics is well established. The identification of abnormal growth is based on comparison with expected measurements for a given gestational age derived from a reference chart. Fetal Doppler assessment, namely umbilical artery (UA), middle cerebral artery (MCA), and their ratio, the cerebroplacental ratio (CPR), is used in the surveillance of suspected FGR fetuses, and abnormal measurements are associated with adverse pregnancy outcomes[4]. However, a large number of reference charts exist, and population bias or heterogeneity in chart methodologies means percentiles for a given measurement may vary considerably[5, 6].

Aim

The aim of this study is to establish which fetal biometry and Doppler reference charts are currently used in Australian and New Zealand practice and how these parameters are being reported.

Methods

Clinicians performing and/or reporting obstetric ultrasound were invited to answer questions about fetal biometry and Doppler charts in a web based survey (Qualtrics, Provo, UT). Invitations were distributed to members of the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANCOG), Royal Australian and New Zealand College of Radiologists (RANZCR) and Australasian Society of Ultrasound in Medicine (ASUM). The survey was approved by ANU HREC 2017/418 and the RANZCOG continuing professional development committee.

References

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Results

Figure 1 Summary of returned surveys used in analysis

230 Returned surveys

- Estimated 15% response rate from RANZCOG members
- Estimated 18% response rate from RANZCR O&G special interest group
- Response rate from ASUM members could not be estimated

86 Exclusions

- 1 did not consent
- 13 did not report US
- 72 too incomplete for analysis

144 Completed and partial responses

- 19 completed to Doppler section
- 125 completed entire survey

Table 1 Summary of survey findings

Fetal Measurements	
Biometry Chart	ASUM (50%) Hadlock (37%) Chitty (16%) Raine (unpublished) (7%)
EFW algorithm	Hadlock (BPD-HC-AC-FL) (70%)
EFW chart	Hadlock fetal weight chart used (69%) Individual customised (14%) Population customised (4%)
Reporting conventions	Percentile for known GA
Fetal Doppler	
UA Doppler	Performed in all third trimester examinations (61%) Performed when EFW <10th percentile (26%)
MCA Doppler	Performed in all third trimester examinations (24%)
CPR	Always reported when MCA performed (55%)
Additional Doppler	Thresholds for when performed varied
Doppler Chart	Most could not name Doppler charts used in their practice
Reporting conventions	UA pulsatility index (58%) MCA pulsatility index (49%) Inconsistencies in how other Doppler parameters were reported Inconsistencies in thresholds for abnormal Doppler
Defining growth restriction	
EFW	<10th percentile (63%)
Abdominal circumference (AC)	AC < 10th percentile (36%) AC < 5th percentile (11%)
Interval growth	Cut-off not defined (12%)

Figure 2 Fetal biometry charts in current use

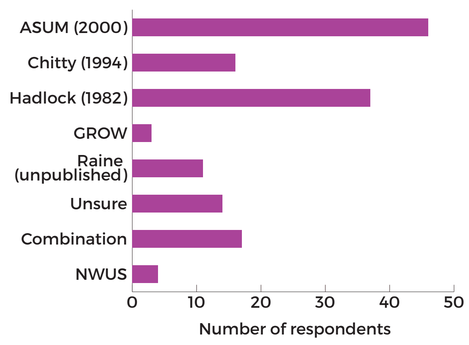


Figure 3 Fetal Doppler charts in current use

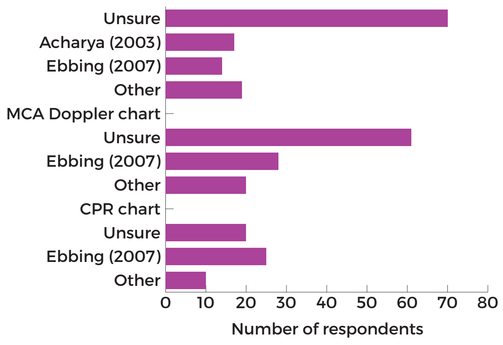
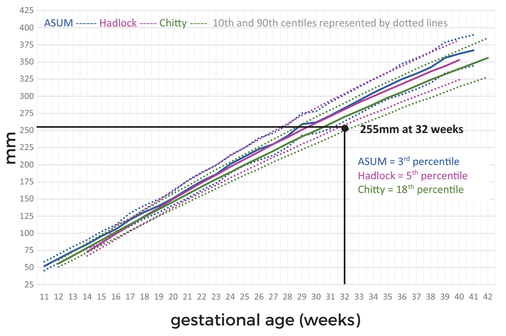


Figure 4 Comparison of commonly used AC charts



Discussion

This survey revealed inconsistencies in choice of reference chart and reporting practices. At least four population based charts are in current use. Comparison of the three commonly used published charts (figure 4) demonstrates how percentiles may vary from satisfactory (18th percentile) to pathological (3rd percentile). With the exception of UA Doppler there were inconsistencies in when fetal and maternal Doppler was performed and how Doppler parameters were reported.

A weakness of this survey is the lower than expected response rate, even when the general decline in response rates in health research and the low reported response rates typical of medical specialists[7] is considered. The impact of this on interpretation of these findings is unclear as it has been shown response rate is not always predictive of nonresponse bias when the target population is relatively homogenous, as is the case with clinicans[8].

When compared to previous studies in 2013[9-11], this study has shown there is some more consistency in biometry charts used in current practice and a greater awareness of which chart is used. A change in reporting practice for UA Doppler was observed, with a decline in the use of the SD ratio favour of the PI. There was also a change preference for fetal weight charts for EFW over birthweight charts.

Conclusion

This survey revealed inconsistencies in choice of reference chart and reporting practices. The potential for misdiagnosis of abnormal fetal growth remains a significant issue and may influence clinical management. These findings highlight the need for a consensus on which reference charts should be used in Australia and New Zealand.

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