

4751:Fetal Abdominal Circumference (AC) measurement in the first trimester has the potential to be a marker for fetal growth deviations

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Introduction: Low birth weight (LBW) neonates are at increased risk of perinatal mortality and morbidity, but the risks can be substantially reduced if the condition is identified prenatally, because in such cases close monitoring and appropriate timing of delivery and prompt neonatal care can be undertaken.

Objectives:

- To assess if the fetal AC measurement in the 1T has a potential to predict low birth weight < 10th centile for gestational age at delivery in singleton pregnancies, in the structurally normal euploid fetuses

Methodology:

- Retrospective study from a tertiary fetal care centre from January 2006 to December 2022
- 12,671 Singleton pregnancies with AC measured in the 1T and CRL between 45mm - 85mm were followed up
- 691 fetuses with structural defects and 216 with chromosomal abnormalities were excluded; 11,764 fetuses were studied
- AC is measured at the level of the stomach bubble
- All scans were performed by FMF certified operators for the NT scan
- Outcome of pregnancy was obtained by telephonic interview of the parents an examination of the hospital delivery records

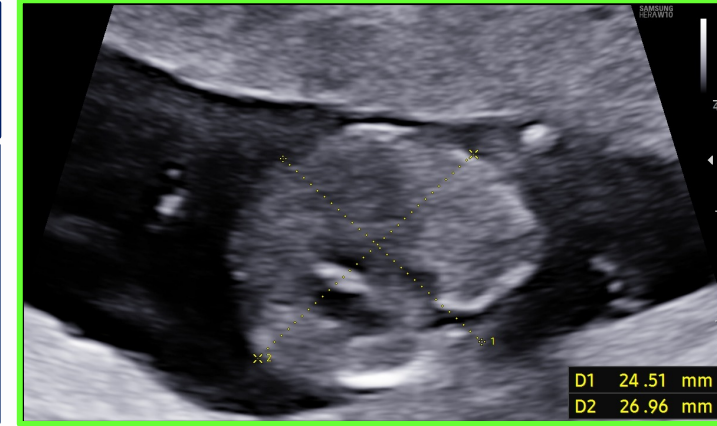


Fig 1: Measurement of fetal AC in the 1T

Results

- 579/ 11,764 (4.9%) fetuses had an AC < 5th centile for CRL
- 134/ 577 (23.2%) fetuses with AC <5th centile and 2155/ 11,134 (19.35%) fetuses with AC > 5th centile had less than 10th centile BW

| | CRL | 5th | 50th | 95th |
|----|-----|-------|-------|-------|
| 0 | 45 | 40.75 | 45.83 | 51.57 |
| 1 | 46 | 41.58 | 46.70 | 52.50 |
| 2 | 47 | 42.41 | 47.56 | 53.43 |
| 3 | 48 | 43.23 | 48.43 | 54.35 |
| 4 | 49 | 44.05 | 49.30 | 55.28 |
| 5 | 50 | 44.88 | 50.17 | 56.21 |
| 6 | 51 | 45.70 | 51.04 | 57.14 |
| 7 | 52 | 46.52 | 51.91 | 58.06 |
| 8 | 53 | 47.35 | 52.78 | 58.99 |
| 9 | 54 | 48.17 | 53.65 | 59.92 |
| 10 | 55 | 48.99 | 54.52 | 60.84 |
| 11 | 56 | 49.82 | 55.39 | 61.77 |
| 12 | 57 | 50.64 | 56.25 | 62.70 |
| 13 | 58 | 51.46 | 57.12 | 63.63 |
| 14 | 59 | 52.29 | 57.99 | 64.55 |
| 15 | 60 | 53.11 | 58.86 | 65.48 |
| 16 | 61 | 53.94 | 59.73 | 66.41 |
| 17 | 62 | 54.76 | 60.60 | 67.34 |
| 18 | 63 | 55.58 | 61.47 | 68.26 |
| 19 | 64 | 56.41 | 62.34 | 69.19 |
| 20 | 65 | 57.23 | 63.21 | 70.12 |
| 21 | 66 | 58.05 | 64.08 | 71.04 |
| 22 | 67 | 58.88 | 64.95 | 71.97 |
| 23 | 68 | 59.70 | 65.81 | 72.90 |
| 24 | 69 | 60.52 | 66.68 | 73.83 |
| 25 | 70 | 61.35 | 67.55 | 74.75 |
| 26 | 71 | 62.17 | 68.42 | 75.68 |
| 27 | 72 | 62.99 | 69.29 | 76.61 |
| 28 | 73 | 63.82 | 70.16 | 77.53 |
| 29 | 74 | 64.64 | 71.03 | 78.46 |
| 30 | 75 | 65.46 | 71.90 | 79.39 |
| 31 | 76 | 66.29 | 72.77 | 80.32 |
| 32 | 77 | 67.11 | 73.64 | 81.24 |
| 33 | 78 | 67.94 | 74.50 | 82.17 |
| 34 | 79 | 68.76 | 75.37 | 83.10 |
| 35 | 80 | 69.58 | 76.24 | 84.02 |
| 36 | 81 | 70.41 | 77.11 | 84.95 |
| 37 | 82 | 71.23 | 77.98 | 85.88 |
| 38 | 83 | 72.05 | 78.85 | 86.81 |
| 39 | 84 | 72.88 | 79.72 | 87.73 |
| 40 | 85 | 73.70 | 80.59 | 88.66 |

Fig 2: Nomogram for AC in 1T for CRL

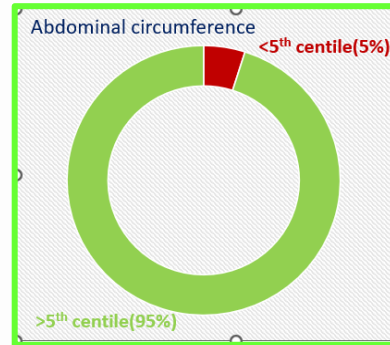


Fig 3: AC < & > 5th centile

References:

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- Papageorghiou A, et al International standards for early fetal size and pregnancy dating based on ultrasound measurement of crown-rump length in the first trimester of pregnancy. Ultrasound Obstet Gynecol 2014
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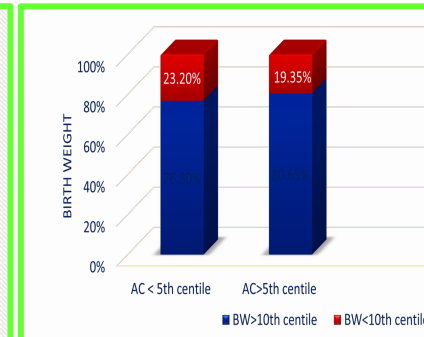


Fig 4: AC Vs BW

Conclusions:

- Feasible to measure the fetal AC in the 1T
- May have a potential to predict birth weight <10th centile (P value-0.02 , odd's ratio-1.26)
- May be an early marker for FGR, preferably in combination with other markers
- Needs to be studied in larger sample volume in combination with other markers for LBW & FGR