



Antenatal trends in FGR fetuses with ‘accelerated growth’ following birth

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OBJECTIVE

- Accelerated early childhood growth is speculated to be a precursor of later metabolic dysfunction in fetal growth restriction (FGR)
- The aim of our study was to determine the trends of fetal cardiac and infant neurodevelopmental indices in growth restricted pregnancies that experience a period of accelerated growth following delivery.

STUDY DESIGN

- Retrospective cohort study
- Follow-up data from a cohort of singleton non-anomalous pregnancy with growth restricted fetuses diagnosed after 20 weeks
- Infants with ‘accelerated growth’ (AG) is defined as an increase in weight z-score greater than 0.8 between 3 months – 3 years after birth
- Infants that did not experience catch-up growth were classified as non-accelerated growth, NAG.
- Antenatal and postnatal parameters were compared between AG and NAG groups:
- Antenatal parameters: estimated fetal weight, EFW; abdominal circumference, AC; thigh volume, TTV; fat mass to lean mass ratio, FLR, cardiac indices (cardiac area, CA; transverse width, TW; global sphericity index, GSI; left ventricular cardiac output, LVCO); umbilical artery pulsatility index, UA-PI; middle cerebral artery index PI, MCA-PI; cerebroplacental ratio, CPR
- Postnatal parameter used is Bayley III Scales of Infant Development (BSID) scoring for neurodevelopmental assessment

RESULTS

- A total of 37 infants with ‘accelerated growth’ and 18 infants with ‘non-accelerated growth’ were analyzed from pregnancies with an antenatal diagnosis of FGR
- Infants with AG had lower EFW percentile (2; 1-5) compared to NAG infants (6; 3-14), otherwise, no correlation was seen in biometric and Doppler parameters (Table 1)
- While comparing cardiac indices, LVCO% in AG neonates was lower than NAG neonates [3.6 (0.2 – 11.9); p 0.01]. This was summarized in table 2
- No significant differences were observed in the early childhood neurodevelopmental outcomes between the two groups

Table 1. Biometric and Doppler parameters comparison of accelerated and non-accelerated groups

	Accelerated growth (N = 37)	Non-accelerated growth (N = 18)	p-value
GA	35.3 (33, 36.14)	35.64 (34.32, 36)	0.75
EFW	1558 (695, 2073)	2103 (1628.25, 2451.75)	0.09
EFW%	2 (1, 5)	6 (3, 14)	0.06
AC	259.2 (210.4, 289.23)	279.79 (177.62, 302.19)	0.4
AC%	1 (1, 5)	8 (2, 13.75)	0.07
UA-PI	1.01 (0.89, 1.12)	0.98 (0.85, 1.13)	0.65
UA-PI%	69 (50, 92)	62.5 (37.25, 92.5)	0.75
MCA-PI	1.71 (1.43, 1.89)	1.88 (1.51, 2.26)	0.19
MCA-PI%	37 (7, 77.5)	65.5 (20.75, 94.75)	0.12
CPR	1.64 (1.27, 1.85)	1.68 (1.59, 2.21)	0.2
CPR%	20.5 (3.75, 41.5)	26 (17.75, 71)	0.24
Total thigh volume	45.46 (34.99, 54.84)	51.67 (49.38, 59.12)	0.19
Fat mass volume	22.73 (16.99, 29.31)	29.69 (27.39, 32.45)	0.16
Lean mass volume	20.39 (17.1, 24.48)	21.51 (19.73, 25.49)	0.4
Fat/Lean mass volume	1.06 (0.89, 1.36)	1.44 (1.01, 1.53)	0.23

RESULTS

Table 2. Cardiac indices comparison of accelerated and non-accelerated groups

	Accelerated growth (N = 37)	Non-accelerated growth (N = 18)	P -value
GSI	1.16 (1.03, 1.28)	1.13 (0.24, 1.16)	0.08
GSI%	21 (2, 71)	13 (0, 23.25)	0.08
GSI < 1.08 - N (%)	8 (21.6%)	2 (11.1%)	0.34
LVCO	124.22 (69.19,163.89)	126.3 (8.39, 215.8)	0.56
LVCO%	3.6 (0.2, 11.9)	6.46 (0.01, 24.85)	0.01
LVCO <5 – N (%)	18 (48.6%)	4 (22.2%)	0.06
CA	1218.04 (1086.28, 1367.97)	1265.1 (140.7, 1476.5)	0.33
CA%	16 (4, 58)	26 (1.25, 65.5)	0.65
CA <5 OR >95 – N (%)	9 (24.3%)	2 (11.1%)	0.25
TW	36.97 (33, 39.51)	37.78 (6.85, 39.78)	0.3
TW%	28 (1, 55)	31 (0, 65.75)	0.9
TW >95 – N (%)	10 (27%)	1 (5.6%)	0.06

CONCLUSIONS

- While not correlating with common tests of neurobehavioral outcome, children with AG appear to have higher risks of in-utero cardiac dysfunction (LVCO%)
- This could have implications for the later emergence of cardiovascular diseases.

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