



POSTER PRESENTATION

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# LGA infants display early catch down growth in length and weight without epigenetic changes

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## Aims

To evaluate the growth patterns of infants born large-for-gestational-age (LGA) from birth to age 1 year compared to those born appropriate-for-gestational-age (AGA). In addition, we aimed to investigate possible epigenetic changes associated with being born LGA.

## Methods

Seventy-one singleton infants born at term were classified by birth weight as AGA (10th-90th percentile; n=42) and as LGA (>90th percentile; n=29). Post-natal follow-up until age 1 year was performed with clinical assessments at 3, 6, and 12 months. Assessments included measurement of infants' weight, length, ponderal index, BMI, as well as head, chest, and abdominal circumference. A subgroup of 38 infants (17 AGA and 21 LGA) was selected for genome-wide DNA methylation analysis. Umbilical cord was collected at birth, and methylation profile on umbilical tissue was analysed using the Illumina Infinium 450K methylation array.

## Results

At birth, the LGA group had greater birth weight ( $P<0.0001$ ), length ( $P<0.0001$ ), head circumference ( $P<0.0001$ ), ponderal index ( $P=0.02$ ), BMI ( $P<0.0001$ ), chest and abdominal circumferences ( $P=0.04$  and  $P=0.007$ , respectively) than AGA newborns. At the age of 3 months, LGA infants still presented greater weight ( $P<0.0001$ ), length ( $P=0.006$ ), BMI ( $P=0.02$ ), as well as head ( $P=0.004$ ) and abdominal ( $P=0.04$ ) circumferences than AGA peers. However, by age 6 months there were no more anthropometric differences between the two groups. This was due to higher length increment in

AGA than LGA infants between 0-6 months (18.3 vs 15.1 cm;  $P<0.0001$ ), whereas length increment was identical in both groups between 6-12 months (7.7 vs 7.7 cm;  $P=0.96$ ). For the genome-wide analysis, more than 485,000 DNA methylation sites covering 99% of human NCBI Reference Sequence (RefSeq) genes were examined at birth, but no differences were found between LGA and AGA infants.

## Conclusion

Despite being born oversized at birth, LGA infants displayed early catch-down growth (i.e. slower length velocity), so that by the age of 6 months LGA infants were of similar length and BMI as AGA infants. In addition, no epigenetic differences in genome-wide methylation were found in those born LGA.

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