

Size at Birth and Early Childhood Growth in Relation to Maternal Smoking, Parity & Infant Breast-Feeding: Longitudinal Birth Cohort Study and Analysis

The relationship between maternal smoking, parity and early breast or bottle feeding to size at birth and childhood growth were evaluated. A large representative birth cohort was studied between 0 and 5 years of age. A total of 1335 normal infants had weight, length, height and head circumference measured at birth and subsequently up to ten occasions until they were 5 years of age. Multilevel modeling was used to analyze the longitudinal growth data. Infants of maternal smokers were systematically small at birth when compared with infants of non-smokers. However, these infants showed complete catch-up growth over the first 12 months of life. Infants of primiparous pregnancies were thin at birth and showed dramatic catch-up growth, and were heavier and taller than infants of nonprimiparous pregnancies from 12 months onwards. Breast-fed infants were similar in size at birth to bottle-fed infants, but grew more slowly during infancy; differences in weight and length persisted throughout the study period. Among infants who showed catch-up growth, males caught up more rapidly than females. The authors concluded that early postnatal growth rates are strongly influenced by a drive to compensate for antenatal restraint or enhancement of fetal growth by maternal uterine-factors.

Ong KKL, et al. *Pediatr Res* 2002;52:863-867.

Editor's Comments: *This very interesting paper provides unique longitudinal growth data from a large prospective birth cohort. Some of the factors studied are well known to alter growth, such as maternal smoking which inhibits growth in utero, and/or breast milk which is known to be associated with lower growth rates in infancy as compared with cow-milk*

formula fed children. However, little data existed for long-term measurements of these types of infants up to 5 years of age. This paper contributes significantly with strong data. Although it is reassuring to note that infants born to mothers who smoke during pregnancy exhibit catch-up growth with no long-term consequences in height, the negative effects of smoking should not be overlooked as they transcend growth. These were not studied in this paper.

Of great interest is the long-term growth divergence in breast-fed infants as compared to bottle-fed infants. This difference in growth progression persists after infancy with significant differences throughout the first 5 years of life. Both weight and height were decreased in the breast-fed group as compared to the bottle-fed group. It is now known that the way infants grow in utero, as well as during the first year of life, might have very important consequences for the development of adult-onset disease. Similarly, the rate of weight accretion during infancy and childhood might play a role in the development of obesity later in life. These data provide evidence that human milk feedings are best for feeding infants, allowing them rates of weight gain for the first 5 years of life that may be more compatible with a more appropriate body weight later in life. In light of the current epidemic of obesity, any factor that may contribute to it should be seriously considered. The growth charts for breast-fed infants developed by the CDC (<http://www.cdc.gov/growthcharts/>) and by the Eurogrowth study (www.Eurogrowth.org) are very useful in monitoring the growth of such children, but these do not extend until 5 years of age; such would be highly desirable in light of these data.

Fima Lifshitz, MD

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Robert M. Blizzard, MD
c/o Fima Lifshitz, MD
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