

Birth Weight and Childhood Growth

Previous studies have recorded that low birth-weight (BWt) infants often exhibit rapid growth in infancy, but do not achieve the same weights and heights in childhood as do their counterparts with normal BWt. Furthermore, low BWt term infants do not grow as well as preterm low BWt infants after the first months of life, indicating the negative effect of intrauterine growth retardation (IUGR) on later growth.

In this report, the relationship between BWt and later childhood growth was studied in several thousand infants. The infants were divided into eight BWt categories, beginning with a BWt of 1,000 g and extending, in 500-g increments, to 5,000 g. Z scores of height for age (H/A), weight for age (W/A), and weight for height (W/H) were calculated. These z scores represent the distance of the observed value from the median of the age-specific and sex-specific reference curve, expressed in SD units. All children were observed from birth to 60 months of age. To evaluate the possible role of BWt in subsequent childhood obesity, the investigators calculated the percentage of children in each BWt category who had W/H z scores > 2.0.

The effect of low, intermediate, and high BWt on growth persisted during the 60 months, although the marked discrepancies in mean weight for the eight groups at birth (mean z score, -2 to +2) were less discrepant than those observed at 60 months of age (mean z score, -1 to +1). Each group continued in its own growth channel in relationship to the other groups, and, therefore, the infants born weighing between 1,000 and 1,500 g were the most weight-retarded at 60 months, whereas the infants with BWt values of 4,500 to 5,000 g were the most weight-accelerated.

The relationship between BWt and z scores for H/A were rela-

Table. Prevalence of abnormal growth by birth weight for children 36 to 41 months of age in the Tennessee Women, Infants, and Children Program, 1975 to 1985

BWt category (g)	H/A	W/A	W/H	W/H
	< -2.0 z (%)	< -2.0 z (%)	< -2.0 z (%)	> -2.0 z (%)
1,000-1,499	12.3	19.8	5.6	1.0
1,500-1,999	11.0	10.4	4.5	1.0
2,000-2,499	11.3	10.6	2.9	1.9
2,500-2,999	7.4	5.9	1.3	2.1
3,000-3,499	4.2	2.9	0.9	2.4
3,500-3,999	2.3	0.9	0.4	3.7
4,000-4,499	1.3	0.5	0.4	5.0
4,500-4,999	0.5	0.0	0.0	8.7

BWt = birth weight; H/A = height for age; W/A = weight for age; W/H = weight for height.

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tively constant after the 24th month. As BWt increased, the percentage of children who had a z score < 2.0 for height at 36 to 41 months declined considerably. However, 12.3% of the very low BWt infants continued to have a z score < 2.0, as compared with 2.3% of those with a BWt of 3,500

to 4,000 g and only 0.5% of those with a BWt of 4,500 to 5,000 g (Table). The W/A and W/H spread is also presented in the Table.

The authors compared the growth of preterm and term infants weighing 2,000 to 2,499 g at birth (Figure). H/A at 0 to 2 months was similar in both groups. Later, the

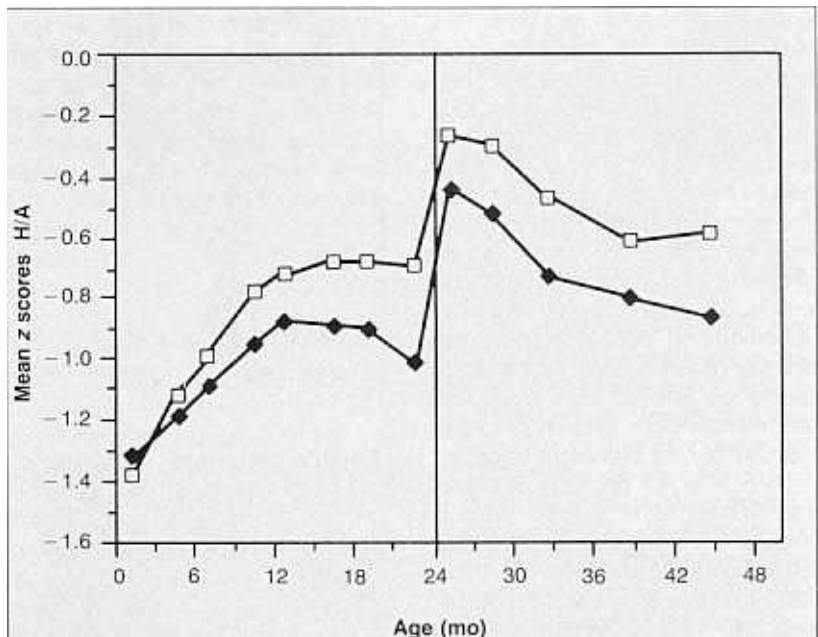


Figure Mean H/A z scores for intrauterine growth-retarded (◆) v premature (□) infants 2,000 to 2,499 g by 3-month age groupings for children < 36 months of age and 6-month groupings for children 36 to 47 months of age. Based on Tennessee-Linked Special Supplemental Food Program for Women, Infants, and Children and birth certificate records, 1975 to 1985.

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IUGR infants had lower z scores than did the premature infants with the same BWt. Median z scores in both premature infants and infants with IUGR remained considerably less than normal, however. Mean z scores for all parameters differed by 0.2 to -0.3 between the two groups, with the preterm infants being taller and heavier than the IUGR group.

High BWt appeared to be a risk factor for obesity (Table). The very high BWt group included 8.7% of the infants with z scores > -2.0 (W/H).

The authors concluded that BWt

strongly predicts future growth in early childhood. Although low BWt infants exhibit significant weight gain in the first 12 months, they are likely to remain shorter and lighter in early childhood than children with higher BWt. Conversely, infants with higher BWt remain taller and heavier on average, and increased BWt is associated with a substantial increase in prevalence of childhood obesity. Finally, IUGR is a stronger risk factor than prematurity for short stature and low weight. Preterm children of the same BWt sustain less permanent growth impairment over the 60

months of observation than those who have IUGR, although both groups remain smaller than their normal BWt counterparts.

Binkin NJ, Yip R, Fleshood L, et al. *Pediatrics* 1988;82:828.

Editor's comment—*This report provides important data to assist in predicting the height and weight at 5 years of age in infants of various sizes. The authors are to be commended for a study that was both much needed and precisely conducted.*

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