Does (rapid) early weight gain cause adult disease and obesity?

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Author	Population Methods	Definition	Results
Adair	Pooled data from 5 birth cohorts n=4,335 Brazil, India, Guatemala, South Africa, Philippines measurements – 0-12, 12-24, 24-48 and 48 to mean age = 30 y	CW=conditional weight actual weight compared to expected weight given prior weights	WAZ scores in infancy and childhood higher in individual with later high HTN CW strongly predicted adult BMI, but not BP The WAZ scores assoc. what not significant after adult height adjustment
Barker	Longitudinal study of 13, 517 born in Helsinki 1924-44	Change in W/A z score 3-11 yrs	SGA and pre term LBW assoc with CVD risk. Preemies decrease wt after birth (3-11yrs) followed by fast increase in wt due to high caloric/nutrient enriched feeding
Bouhours Nouet	Studied BW – HBW, LBW and insulin met. and whether catch-up weight after 2 yrs and increased fat increases insulin resistance and risk of CVD n = 117 obese children 10 – 12 yrs	HBW >90th percentile weight for age LBW <10th percentile weight for age	HBW had higher adiponectin, insulin sensitivity, and lower insulin resistance
Ekelund	Stockholm Weight Development Study 128 males 0-17 yrs	Change in W/A z score 0-6 mo of age Rapid weight gain 0.67 z score W/A (n=32)	⬆W/A increase 0-6 mo Assoc with higher BP at 17 yrs of age
Eriksson 2006	2,003 indiv. born in Helsinki 1934-44	Less than expected given prior weights	T2DM and IGT assoc. with low weight gain bwtn 0-2 yrs (greatest effect in LBW)

Eriksson 2003	8,760 indiv. born in Helsinki in 1934-44		The rate of growth was not related to T2DM in LBW, but HBW (>3.5 kg) babies with slow length 0-3 mo predicted T2DM at > 40 yrs
Fabricius-Bjerre	30 SGA & 57 AGA mean age 17.6 yrs (term)	0.67 z score increase 0-3 mo.	Rapid weight gain 0-3 mo assoc with impaired glucose metabolism
Jarvelin 1966	5,960 Finnish 1960 cohort 0-31 yrs	⬆ 0.67 z score W/A birth to 1 year of age	Increase in W/A birth to 1 year of age, LBW, SGA (males) assoc with higher systolic BP at 31 years of age
Kajantie	Helsinki Birth Cohort n=1999 men and women mean age =62 yrs	Conditional weight = measured how much weight differed from predicted (residuals of regression analysis)	**LOW** BMI assoc with higher LDL, VLDL, etc. Low correlation btwn birth and adult BMI RAPID early weight gain assoc with HIGHER HDL, lower LDL, VLDL
Kerkhof 2012	406 indiv 18-24 yrs PROGRAM		Preemies <36 GA had higher unadjusted SBP PP and DBP, but this disappear when adjusting for HR
Leunissen 2009	87 participants PROGRAM study 18-24 yrs (57 SGA & short stature)	⬆ 0.67 z score W/A ⬆ 0.5 z score W/A	Significant assoc. between early weight gain 0-3 mo and CVD's risk factors
Larnkjaer	95 term and AGA 0-17 yrs	Change upward in weight z score	Weight gain 0-3 mo assoc with body fat, ghrelin, and adiponectin, but not to leptin and IR
Law	n=346 British indiv. 0-22 years of age	Conditional weight 'Residual of current weight regressed to prior weights to show deviations from expected weights'	No assoc. btwn infancy weight and BP at 22 yrs of age BUT there was an assoc btwn faster wt gain 1-5 yrs of age and higher adult systolic BP

Norris	6.511 indiv. Brazil, India, Guatemala, South Africa, Philippines	Conditional weight	Lower BW and fast weight gain after 48 mo assoc with IR (not GT)
Nazmi	5,914 men and women in Pelotas, Brazil Measure CRP levels		Weak assoc. btwn CRP and infancy weight in males less than 2 yrs In females infancy weight assoc with CRP levels
Singhal 2007	153 children 6-8 yrs with enriched formula (28% more protein, n=70) or standard term formula (83) Randomized study	Change in z score	Rapid early weight gain promoted by enriched formula results in higher BP
Singhal 2003	106 preterm babies with enriched formula, 110 preterm babies with standard formula and 61 term babies with enriched formula 0-13 to 16 yrs	Change in z score	Adolescents born preterm (and healthy term) fed enriched formula who gained more weight at 2 wks of age had more insulin resistance
Woods	16 short SGA (who did not achieve catch up growth) and 7 short AGA		IR happened in short SGA even when they did not achieve catch up growth