

The Association Of Birth Weight With Cardiovascular Risk Factors In Early Childhood

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Introduction: Cardiovascular disorders are one of the leading causes of mortality and morbidity in the modern World. Since cardiovascular disorders are initially subclinical and it takes a long time for the symptoms of the disease to become apparent. Therefore it is important to point out the predisposing factors and early subclinical findings to improve the outcome. In adult studies, mortality due to cardiovascular diseases was high in low and high birth weight. Prevention of cardiovascular risks would be an ideal method for the future well-being of people. The aim of this study was to determine the effect of birth weight on cardiovascular disease and body composition in early childhood.

Methods: This study was carried out prospectively in healthy children admitted to Pediatric Department of Cumhuriyet University between January 2012 and January 2013. The study population comprised of early childhood aged 2-5 years, that is a term AGA children (n=22), term SGA children (n=22), term macrosomic children (n=22). Anthropometric measurements including height, weight, skinfold thicknesses, waist circumference, and head circumference. The plasma glucose, insulin levels, serum total cholesterol, LDL, HDL, and triglyceride concentrations were measured.

Results: The children in SGA group had significantly lower weight and body mass index compared with those in AGA group respectively and to those in macrosomic group respectively. The fasting glucose levels were significantly higher in SGA group and macrosomic group respectively than in AGA group. The children in SGA group had significantly higher insulin levels and HOMA-IR index when compared to the children in AGA and macrosomic groups. Total cholesterol, HDL cholesterol, triglycerides, systolic and diastolic blood pressure were comparable among the study groups.

	AGA infants (n=22)	SGA infants (n=22)	Macrosomic infants(n=22)	P
Birth weight, kg, median (range)	3.4 (3.2-3.5)	2.3 (2.3-2.4)	4.4 (4.2-4.6)	0.001
Length at birth, cm, median (range)	50.2 ± 1.2	48.3 ± 2.4	52.2±1.4	0.04
Head circumference at birth,cm, median (range)	34.8 ± 1.7	31.5 ± 2.4	35.4 ± 1.8	0.01
Weight, kg, median (range)	17(16-18)	16(15-17)	19 (18-20)	0.01
Height,cm, median (range)	106(102-109)	102 (98-105)	106(102-110)	0.1
Head circumference, cm,median (range)	50 (49-51)	50 (49-51)	50(49-51)	0.6
BMI (kg/m ²), median(range)	16 (15-17)	15(15-16)	17 (16-18)	0.05
Triceps skinfold thickness,median (range)	11(10-13)	11 (10-12)	11(10-13)	0.9
Fasting glucose, mg/dL, median(range)	80 (75-85)	85 (80-91)	87(82-92)	0.04
Insulin, mIU/mL, median (range)	5.3 (3.2-7.3)	7 (3.7-10.0)	4.5(3.2-5.9)	0.02
Total cholesterol, mg/dl, median(range)	123(106-140)	112(99-125)	110 (94-124)	0.6
Low-density lipoprotein cholesterol, mg/dl, median (range)	67(56-78)	43 (33-55)	40(33-47)	0.01
High-density lipoproteincholesterol, mg/dl, median (range)	33(29-38)	33.2 (29-38)	30 (23-36)	0.3
Triglycerides, mg/dl, median (range)	82(68-97)	80(55-105)	94(71-117)	0.4
HOMA-IR index, median (range)	1.02(0.5-3.1)	1.5 (0.7-2.4)	1.01 (0.6-5.1)	0.02

Conclusion: Our findings indicated that although BMI was significantly higher for macrosomic births when compared to term AGA children, anthropometric measurements were not related to insulin resistance and metabolic syndrome. However, children in small for gestational age group were shown to develop insulin resistance in early childhood. Further studies are needed in larger cohorts of children to confirm whether or not there is a relationship between birth weight and anthropometric measurements and the cardiovascular risk.