THE EFFECTS OF THE BIRTH WEIGHT ON THE FAT DISTRIBUTION AND FATNESS PARAMETERS OF THE BODY

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BACKGROUD:

The weight of birth affects the weight status and fat distribution in the later period of life. It is suggested that both low and high birth weight pose a risk for cardiometabolic diseases. In this study, the effects of birth weight on body fat mass and body fat distribution parameters during childhood and adolescence period were evaluated.

METHOD:

In this cross-sectional study, 4581 children ages between 6-17 years at primary and secondary schools were determined by the stratified sampling system. Anthropometric parameters such as height, weight, waist circumference (WC), neck circumference, triceps skin fold thickness (SFT) were measured by appropriate methods. Body mass index (BMI) values were calculated, and amount of total body fat was assessed by bioelectrical impedance. Week and weight of birth information noted by the questionnaire sent to the parents. 755 children were excluded from the study due to missing data, history of premature or late-born.

RESULTS:

46% of children were male. Birth weight was below 2500 gr in 11.6% and over 4500 gr in 4.1% of patients. The 10th, 50th and 90th percentile values of the anthropometric measurements were evaluated separately according to age and gender. Birth weight was found low in all age and gender groups. Those who are above the 90th percentile are more common than the normal weighted ones in almost all parameters and the 10th percentile values are at the lowest level compared to the other groups. Likewise, those who had higher birth weight had the 10th percentile value at the top of all anthropometric measurements from the age of six. However, this group could not be evaluated because it had not suitable number for the 90th percentile. While all anthropometric measurements showed an increase with age, body fat percentage decreased in boys in pubertal ages, while it showed little increase in girls at the same age.

According to Birth Weight

< 2500 gr : small for gestational age (SGA)
2500-4500 gr: appropriate for gestational age (AGA)
> 4500 gr : large for gestational age (LGA)

Table 1: BMI evaluation by birth weight (boys)

Years	SGA		AGA		LGA	
	Obesity	OW	Obesity	OW	Obesity	OW
7	0	**7,1**	9,9	6,3	0	**11,8**
8	7,1	**21,4**	11,2	7,2	**21,4**	**21,4**
9	**20**	**20**	14,8	1,7	**15,8**	**21,1**
10	**14,3**	7,1	11,3	12,7	0	**13,3**
11	**10,5**	5,3	8,1	12,2	**14,3**	**14,3**
12	9,1	0	11,3	14,4	**14,3**	**28,6**
13	**14,3**	7,1	9,2	13,3	**15,4**	7,7
14	6,3	6,3	9,4	10,4	**25**	6,3
15	5	**15**	10,8	13,7	4,5	**22,7**
16	**17,6**	5,9	9,5	9,5	**13,6**	**13,6**
17	0	0	4,3	6,5	0	**37,5**

Table 2: BMI evaluation by birth weight (girls)

Years	SGA		AGA		LGA	
	Obesity	OW	Obesity	OW	Obesity	OW
7	17,6	0	13,6	4,3	**20**	0
8	**17,4**	0	13,2	5,9	11,1	0
9	4,2	4,2	10,3	12	**25**	**16,7**
10	13,6	4,5	14,6	13,9	**33,3**	13,3
11	5,9	**17,6**	13,5	11,7	**40**	**40**
12	3,4	**10,3**	8,9	9,8	**20**	10
13	**16,7**	**12,5**	10,5	10,5	**12,5**	**12,5**
14	11,1	16,7	15,5	16,5	9,1	**36,4**
15	4,5	**25**	7,4	14,9	3,7	**25,9**
16	6,7	13,3	8,9	7,3	8,8	**14,7**
17	5,9	**23,5**	1,6	11,1	**37,5**	0

Table 3: Fat % evaluation by birth weight

	Boys			Girls		
Years	SGA	AGA	LGA	SGA	AGA	LGA
7	10	14,5	11,8	**25**	11,1	**20**
8	9,1	15,6	**45,5**	**17,4**	18,8	11,1
9	30	17,3	**31,6**	5	15,1	**36,4**
10	10	15,2	7,1	**27,8**	17,2	**38,5**
11	7,1	11,7	**16,7**	**14,3**	8,7	**50**
12	10	19,4	**33,3**	7,7	11,2	10
13	**23,1**	15,1	**23,1**	8,7	15,2	**25**
14	6,7	13	**25**	16,7	21	18,2
15	10,5	16,8	**18,2**	9,1	11,6	3,7
16	**18,8**	15,4	9,5	10	13,8	**20,6**
17	0	8,7	**12,5**	**17,6**	6,3	0

Table 4: Obesity rates in other parameters of normal male patients according to BMI

	SGA		AGA		LGA	
	Prepub.	Pub.	Prepub.	Pub.	Prepub.	Pub.
WC	1	13.3	20	20.1	13	**22.2**
Fat %	2	1,6	1,6	2,7	1,6	**5**
Triceps sft	12,5	6	11,2	5	8,7	6,5

Pub.: puberty

Table 5: Obesity rates in other parameters of normal female patients according to BMI

	SGA		AGA		LGA	
	Prepub.	Pub.	Prepub.	Pub.	Prepub.	Pub.
WC	**68.3**	15.8	55.5	**34.6**	44.4	19.4
Fat %	**5,1**	0,8	1,5	2,1	**9,1**	2,9
Triceps sft.	5,9	2,2	**10,7**	4,4	**11,1**	**5,7**

Pub.: puberty

COMMENT: It is known that children with low or high birth weight are at higher risk for obesity and cardiovascular diseases in older ages. In this study, the effect of birth weight on anthropometric parameters showing fat deposition such as body fat percentage and upper body fat and central adiposity from 6 years of age was evaluated according to age and sex and it shows the effect of birth weight at older ages