

BODY COMPOSITION AND KIDNEY INJURY BIOMARKERS IN CHILDREN WITH HISTORY OF LOW BIRTH WEIGHT

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INTRODUCTION

The prevalence of Chronic Kidney Disease (CKD) has increased at an alarming rate over the past years.

Low birth weight (LBW) has been linked with development of CKD mainly by its association with reduced nephron number (nephropenia). Few studies have been reported in children about the effects of LBW on body composition and kidney function.

OBJECTIVE

The aim of this study was to assess differences in body composition and kidney function biomarkers in 8 to 10-year old children with or without a history of low birth weight (LBW).

STATISTICAL ANALYSIS

The descriptive analysis was performed using mean and SD for continuous variables with normal distribution. Means comparison were performed using T student tests. Statistically significant difference was considered if the p value was less than 0.05.

METHODS

Cross-sectional study made in school-age children between 8 and 10 years of age with or without history of LBW

A sample of 114 children were included, 97 with adequate birth weight (ABW) and 17 with a history of LBW.

Anthropometric measurements were taken (body height and weight, waist and thigh circumferences, triceps and subscapular skinfolds).

Kidney function was assessed by measurement of kidney injury biomarkers such as creatinine, urea, albumin/creatinine index (alb/Cr) and neutrophil gelatinase-associated lipocalin (NGAL).

RESULTS

114 children, age 8-10 years old were included; the prevalence of overweight and obesity in this population was 41%, there was a difference in fat distribution being lower in the LBW children percentages, with an odd ratio (OR) of 6.1 (IC95% 1.98-19), for low body fat in the LBW group.

There was no difference in creatinine, GFR and urea values between the two groups, females had a higher values of uNGAL than males and there was no difference according to birth weight.

Diastolic blood pressure was significantly higher in LBW children (70±10 vs 65±7 mmHg p=0.01).

TABLE 1: Comparison of variables according to birth weight

	NBW n=97	LBW n=17	p*
BW (Kg)	3.2±0.3	2.4±0.1	0.009
Gestational Age (Weeks)	38±1	38±1	NS
Age (yrs)	9.4±0.8	9.9±0.8	0.01
Weight (Kg)	33±9	32±9	NS
Height (cm)	133±7	134±8	NS
BMI (Kg/m ²)	18.5±4	18.0±3	NS
P/E (z-score)	0.09±1	-0.5±0.9	NS
T/E (z-score)	-0.4±0.8	-0.8±1	NS
IMC/E (z-score)	0.7±1	0.2±1	NS
Systolic BP (mm/Hg)	98±8	101±10	0.06
Diastolic BP (mm/Hg)	65±7	70±10	0.01

TABLE 2: Comparison of variables according to uNGAL

	NGAL <10 n=102	NGAL >10 n=12	p*
Female (%)	48 (47)	12 (100)	0.002
Birth weight (Kg)	3.0±0.4	3.2±0.4	NS
LBW (n%)		1/12	NS
Gestational week	38±1	38±1	NS
Age (yrs)	9.5±0.8	9.3±0.8	NS
Weight (kg)	33±9	33±10	NS
Height (cm)	133±7	134±6	NS
BMI (Kg/m ²)	18.5±4	18.0±3	NS
% Fat	21±7	23±10	NS
SBP (mm/Hg)	98±9	97±6	NS
DBP (mmHg)	65±7	67±8	NS
Glucose (mg/dl)	85±7	86±9	NS
Urea (mg/dl)	22±6	19±4	NS
Creatinine (mg/dl)	0.57	0.55	NS
Uric Acid (mg/dl)	4.2±0.8	3.7±0.8	NS
PCR	0.19±0.4	0.06±0.04	NS
GFR (Schwartz)	97±8	100±7	NS
Alb/Cr (mg/mgCr)	0.08±0.09	0.06±0.02	NS

CONCLUSIONS

We found significant differences in the body composition between the two groups as well as higher values of diastolic blood pressure in LBW infants.

Urinary values of NGAL were significantly higher in females than males, and these values were independent of the birth weight

This is an important public health issue and we recommend a close follow-up in these children in order to prevent future complications