EVALUATION OF RENAL FUNCTIONS AND BLOOD PRESSURE IN LOW BIRTH WEIGHT CHILDREN

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The "fetal programming" hypothesis, suggests that intrauterine development, leading to low birth weight, results in permanent alterations of fetal physiology that persist into the postnatal period. It has been reported a marked association between LBW and reduced nephron number. We aimed to investigate renal functions and blood pressure in healthy children who were born with low birth weight and the effects of low birth weight on renal functions and blood pressure.

This study was carried on 33 children aged 7 to 18 years who admitted chidren outpatient clinic and were learned born with a birth weight under 2500 gr, without a known disease or use of medication during the study period. The control group included 30 age- and sex-matched healty children who were born at term with a birth weight appropiate for gestational age. Microalbumin, N-Acetyl-β-D-Glucosaminidase, Na and K in the 24 hour urine and BUN, creatinine, cystatin-C levels in the blood were investigated in all patients and the control group. Size, parenchymal thickness, AP diameter and volume of the kidneys were examined by ultrasound. 24 hours blood pressure measurements with the blood pressure monitor were recorded as the day-night mean blood pressure, the blood pressure loads and the dipper-non-dipper characteristics.

Table I. Urine microalbumin, NAG, protein, Na and K excretion in patients with study and the control group *P<0,05

	Study S=33	Control S=30	p
Urine Na	144,6±243,6	138,86±71,7	,012*
Urine K	34,7±31,9	40,7±18,9	,030*
Urine microalbumin (µg)	12,8±17,71	17,5±14,47	,017*
Urine protein (mg/m²/h)	3,44±1,77	4,07±1,96	,187
Urine NAG (IU/L)	0,44±0,04	0,41±0,03	,014*

According to the laboratory evaluations the patients have higher levels of blood cystatin-C (Figure 1) and urinary Na and N-Acetyl-β-D-Glucosaminidase excretion than the control group (Table I). In the ultrasound evaluation kidney volumes were smaller in the LBW group than in the controls despite all kidneys were anatomically normal. Mean of three manuel blood pressure measurements was normal in all chidren. According to the results of ambulatory blood pressure measurements, two groups did not differ in the mean daytime or nighttime systolic and diastolic blood pressure, day-night systolic-diastolic blood pressure loads and the ratio of non-dipper blood pressure.

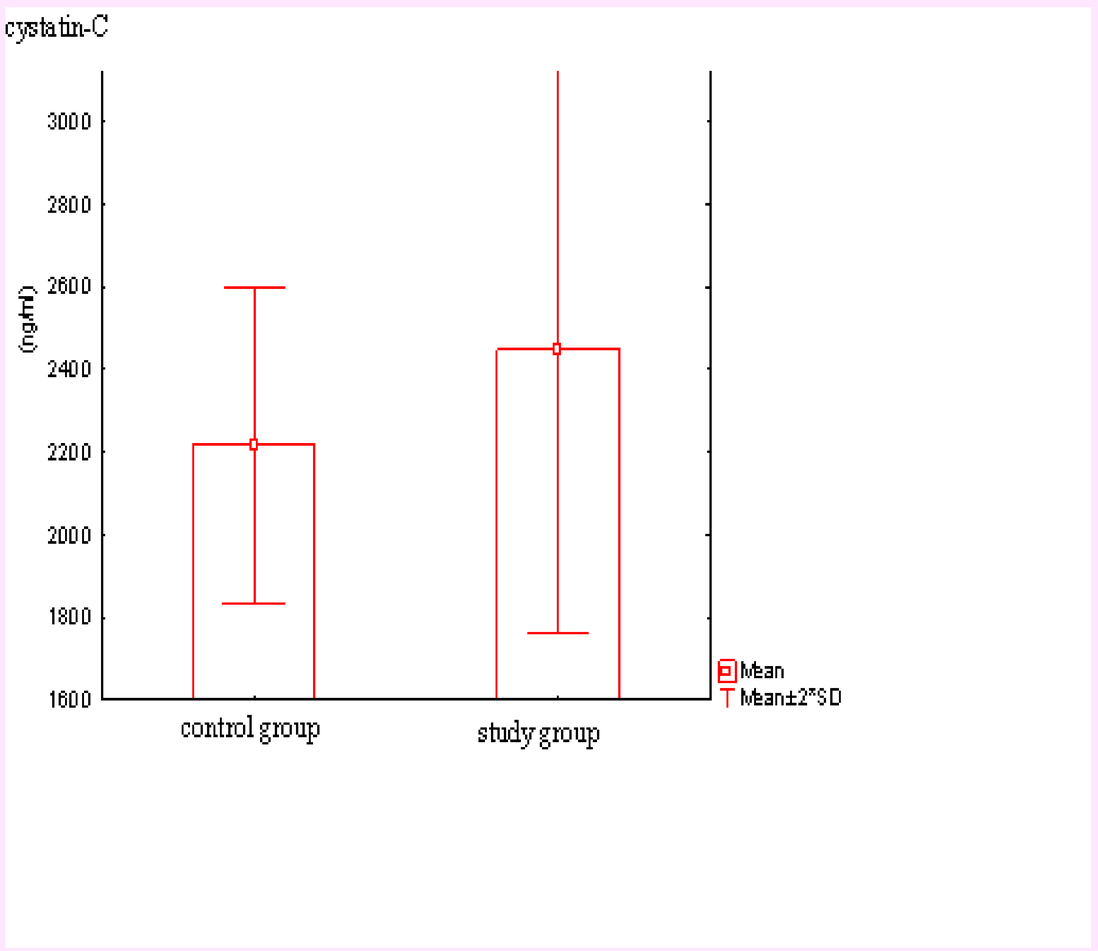

Figure 1: Serum cystatin C levels in study and control groups

In conclusion, it appears that children born with LBW have deterioration of renal function as a result of insufficiency in kidney development due to tubular damage. Our findings do not demonstrate the presence of hypertension in children born with LBW in childhood. Larger groups including children born with very low birth weight are needed in future studies. We suggest that LBW children should be follwed for renal function and blood pressure.

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