



# Serum Uric Acid Levels in Normotensive Children With Family History of Essential Hypertension

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## INTRODUCTION

Many factors, including family history, genetics, insulin resistance and high body mass index may play a role in the development of essential hypertension. The family history is an important risk factor for essential hypertension seen in children. It has been said that hypertensive patients with nondipper blood pressure status have higher end organ damage. Increased left ventricular mass is an important marker for hypertensive cardiac injury. Furthermore it has been reported that elevated serum uric acid concentrations contribute development of essential hypertension at early stages. Although the mechanisms of the association between childhood uric acid levels and future blood pressure are not known, acceptable physiological mechanisms by which higher levels of uric acid might cause hypertension have been suggested by recent experimental studies. Several lines of evidence suggest that uric acid is a causal factor in human hypertension.

The aim of this study was to evaluate diurnal blood pressure variation (dipper and nondipper status) of normotensive children with family history of essential hypertension and relationship between left ventricular mass and serum uric acid level.

## PATIENTS

Study Group	n: 40
Female	19
Male	21
Control Group	20
Female	10
Male	10

## METHODS

- Medical history ✓
- Physical examination ✓
- 24h ambulatory blood pressure monitoring ✓
- Echocardiographic examination ✓
- Serum uric acid level ✓ (calorimetric enzymic measurement)

Age: 8-22 years

Children with family history of hypertension divided into two subgroups according to blood pressure variation as **dipper** and **nondipper** group.

The person whose night time mean blood pressure measurements were found 10% or more lower compared to mean day time measurements were classified as **dipper**

Study group: The normotensive offsprings of hypertensive parents  
Control group: The normotensive offsprings of normotensive parents

## RESULTS

Daytime diastolic blood pressure, night systolic blood pressure and mean diastolic blood pressure were higher in nondipper group than dipper and controls ( $p < 0.05$ ) (table 1). Daytime systolic blood pressure and systolic load was higher in offspring of hypertensive than normotensive families but differences are not statistically significant. Echocardiographic examination showed increased left ventricular mass index in offspring of hypertensive families. Especially the nondipper group showed higher left ventricular mass index and serum uric acid levels compared with dipper and controls ( $p < 0.001$ ) (table 2). Left ventricular mass index results of children with family history of hypertension were corrected by age and then Ridge regression analysis was performed. It is observed that left ventricular mass index change with serum uric acid levels ( $p < 0.05$ ), daytime systolic blood pressure levels ( $p < 0.05$ ), night systolic ( $p < 0.05$ ) and diastolic blood pressure levels ( $p < 0.05$ ).

TABLE 1	Dipper (n:19)	Nondipper (n:21)	P
Mean systolic blood pressure (mmHg)	113 ± 8	112 ± 7	p > 0,05
Mean diastolic blood pressure (mmHg)	62 ± 4	64 ± 6	p < 0,05
Daytime systolic blood pressure (mmHg)	116 ± 8	120 ± 9	p > 0,05
Daytime diastolic blood pressure (mmHg)	65 ± 5	69 ± 7	p < 0,05
Night systolic blood pressure (mmHg)	101 ± 7	107 ± 7	p < 0,05
Night diastolic blood pressure (mmHg)	56 ± 7	57 ± 4	p > 0,05
Systolic load (%)	5 ± 7	7 ± 7	p > 0,05
Diastolic load (%)	1,1 ± 1,95	1,8 ± 2,7	p > 0,05
Mean pulse pressure (mmHg)	49 ± 5	51 ± 6	p > 0,05

TABLE 2	Dipper (n:19)	Nondipper (n:21)	Control (n:20)	p
Uric acid level (mg/dl)	3,3 ± 0,9	4,6 ± 0,8	3,3 ± 0,8	P < 0,001
Left ventricule mass index	62 ± 8	84 ± 11	61 ± 13	P < 0,001

## CONCLUSION

- ❖ We demonstrated that higher serum uric acid levels are strongly correlated with higher blood pressure levels in normotensive children with parental hypertension (especially in nondipper group).
- ❖ Our data cannot prove causality or a particular mechanism but impress the notion that uric acid may play a role in the pathogenesis of essential hypertension.
- ❖ Normotensive offsprings with a family history of hypertension showed early alterations in cardiac structure before onset of hemodynamic load (especially in nondipper group).
- ❖ It can be argued that these cardiac changes might have a genetic basis with the trait of essential hypertension.

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