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### The effect of antihypertensive medications dosing on blood pressure control and left ventricular hypertrophy in children with chronic kidney disease

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## Research Abstract Title

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**IRB Number:** 18010022

**Describe role of Submitting/Presenting Trainee in this project (limit 150 words):**

Benjamin developed the research question, reviewed the background literature, obtained access to the CKiD data on which the research was based, and performed all data analysis with guidance from his mentor and the contributors.

**Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words**

**Background:** Hypertension (HTN) is a major risk factor for poor cardiovascular and renal outcomes in patients with chronic kidney disease (CKD). A recent report from the Chronic Kidney Disease in Children (CKiD) study revealed a high prevalence of uncontrolled hypertension that may be in part related to suboptimal treatment. The influence of antihypertensive medication (antiHTN) dosing on blood pressure (BP) control and left ventricular hypertrophy (LVH) in the pediatric CKD population is unknown.

**Objectives/Goal:** To determine the role of antiHTN medication dosing and other possible factors on BP control and LVH in children with CKD treated for HTN.

**Methods/Design:** A cross-sectional analysis of children enrolled in the CKiD study at their 3rd visit. BP was defined as controlled (cHTN) or uncontrolled HTN (uHTN) based on casual BP and ABPM. uHTN included ambulatory HTN (AH) and masked HTN (MH). LVH was defined as LVMI >95th%-ile. The prescribed dose of each antiHTN drug was characterized by the newly developed Drug Dose Index (DDI). The DDI of an individual drug was defined as the ratio between the actual dose and the maximum reference dose (up to maximum of 1) given a patient's age, weight and eGFR. For patients taking multiple antiHTN drugs, the cumulative DDI (cDDI) was the sum of individual DDIs. Variables analyzed included: age, sex, race, glomerular vs non-glomerular etiology, UProt:Cr ratio, BMI category, eGFR and number of antiHTN agents. For statistical analysis t-test, ANOVA and chi-square test were used.

**Results:** 255 subjects were included in the study [cHTN 105, uHTN 150 (AH 45, MH 105)]. Patients with cHTN tended to be Caucasian ( $p < 0.05$ ), received fewer medications ( $p < 0.01$ ) and tended to have a lower cDDI ( $p = 0.08$ ) [Table 1]. AH patients received a higher number of medications vs. cHTN ( $p < 0.01$ ) and MH ( $p < 0.05$ ), and higher cDDI than cHTN ( $p < 0.05$ ) [Fig 1]. Compared with MH, AH patients had a lower eGFR ( $p < 0.05$ ) and higher proteinuria ( $p < 0.05$ ). cDDI was higher in AH vs. cHTN among overweight children, younger children ( $< 10$ y) and adolescents (13-16y), as well as in those with LVH (in all  $p < 0.05$ ) [Table 2].

**Conclusions:** Compared to CKD children with cHTN, those with uHTN or LVH were taking a comparable number or more antiHTN medications and had a higher cDDI. Those with AH had a lower eGFR and higher proteinuria vs. MH. Further research to address the persistence of hypertension in treated CKD patients is required.