

Renal volume in children with autosomal dominant polycystic kidney disease.

S. Papizh, V. Dlin, I. Leontieva, K. Tutelman

Research and Clinical Institute for Pediatrics at the Pirogov Russian National Research Medical University, Moscow, Russian Federation

Objectives :

Autosomal dominant polycystic kidney disease (ADPKD) is characterized by increased total kidney volume and development of hypertension with target organ damage.

The aim of the study was to identify the relationship of increased total kidney volume with hypertension and left ventricular damage.

Methods:

45 children (23M/22F) with ADPKD were examined. The median age was 14.0 (IQR: 10.0;15.0) years. We checked blood pressure with ABPM (45 patients aged 5 to 17 years) with estimate of the mean daily BP, mean pulse BP. Patients were divided into 3 groups according to three levels of BP: hypertension (HBP; greater than the 95th percentile for sex, age, and height), high normal BP (HNBP; 90–95th percentile), and normotension (NBP; less than the 90th percentile). Total kidney volume (cm³) assessed by ultrasound, corrected for standard body surface and estimation by centile tables. Patients were divided into 3 groups: kidney volume <97%, ≥97%+<50%, 97%+≥50%. Standard two-dimensional echocardiogram was performed. LVM was corrected for body surface area in g/m^{2.7}.

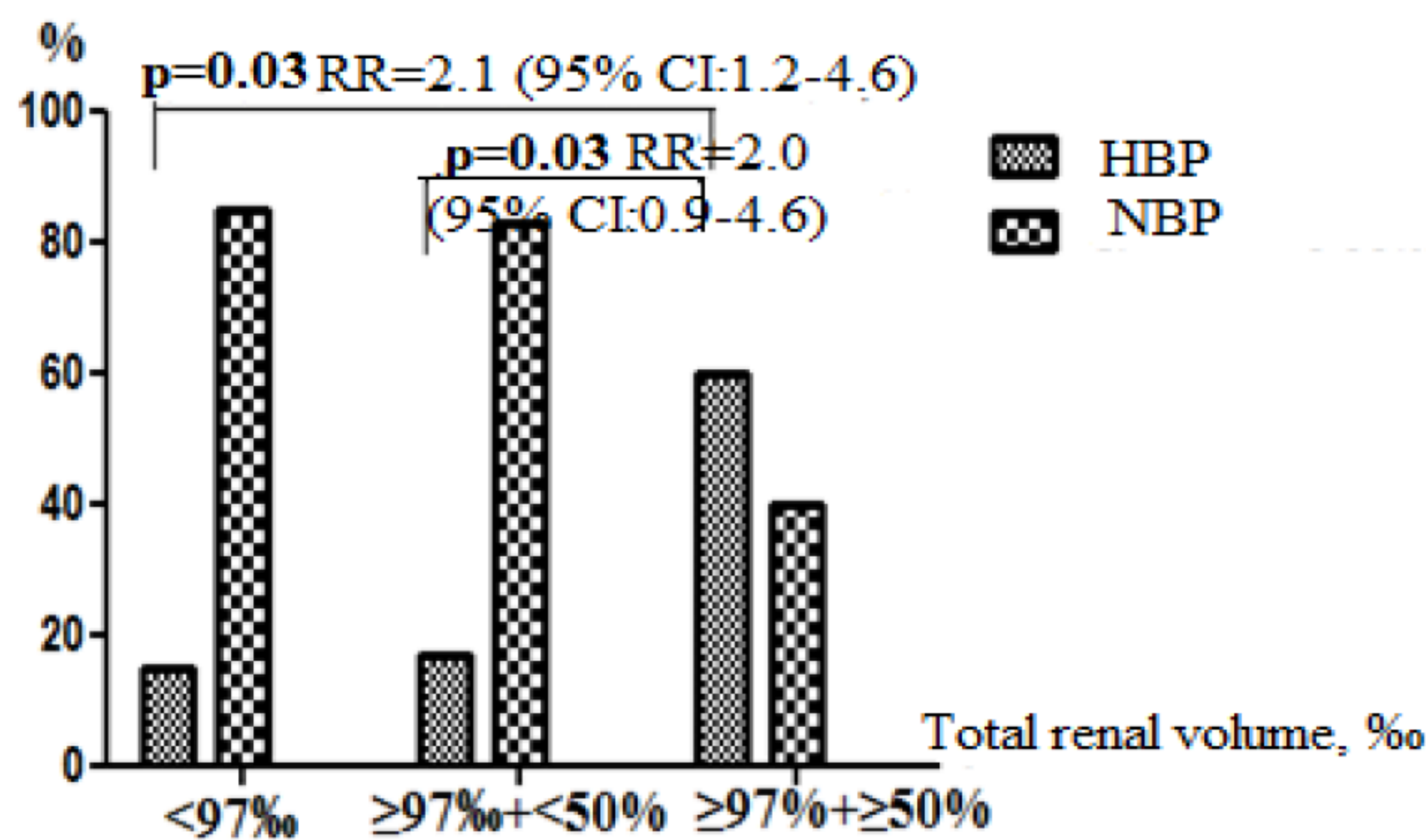


Fig.1 Frequency HBP depending on the total volume of the kidneys

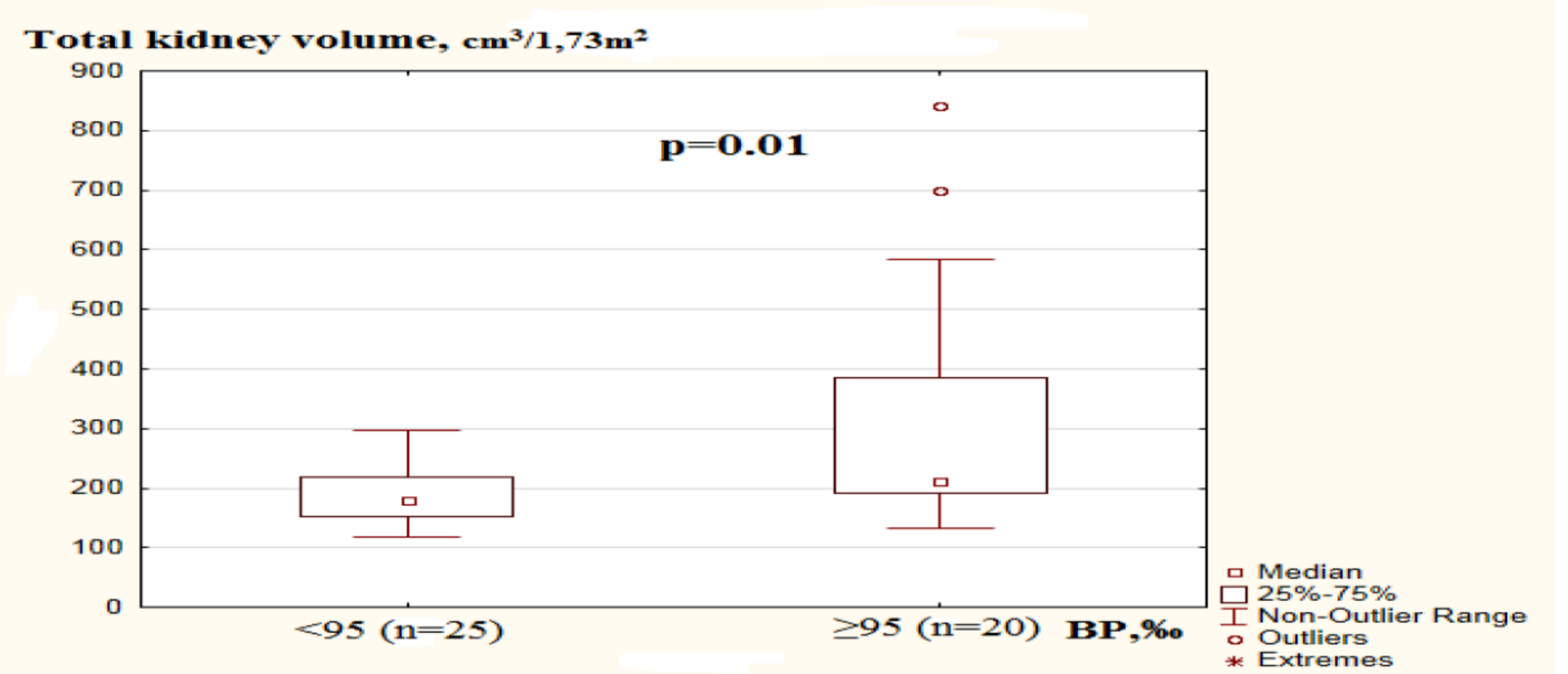


Fig. 2 Total kidney volume in children with hypertension and normal and BP

Results:

Hypertension was found in 44,4% (20 of 45 children) of cases, the median age was 15 (IQR: 13,5;15,5) years, HNBP was in 15,6% (7 of 45 children) of cases, NBP was in 40% (18 of 45 children). Increased total kidney volume of more than 97% were detected in 73,3% (33 of 45 children) of cases. HBP were detected more frequently in children with increased renal volume (cm³/1,73m²) more than 97%+≥50% compared with children with renal volume less than 97% and children with renal volume less than 97%+<50%: 62% vs. 18% (p=0.03), RR=2.1 (95% CI:1.2-4.6) and 62% vs. 20% (p=0.03), RR=2.0 (95% CI:0.9-4.6) (Fig. 1). The HBP children had significantly higher total renal volume (cm³/1,73m²) than the NBP group: 213.9 (194.1;267.25) vs. 179.9 (115.1;215) (p=0.01) (Fig. 2). There was no significant difference in total renal volume between the HNBP and HBP, NBP groups. A moderate correlation between renal volume (cm³/1,73m²) and mean daily BP (r=0.53, p=0.0002), mean pulse BP (r=0.36, p=0.02), LVMI % (r=0.34; p=0,02) was observed. LVMI≥90% were detected more frequently in children with increased renal volume (cm³/1,73m²) more than 97% compared with children with renal volume less than 97%: 36% vs. 7% (p=0.03), RR=1.5 (95% CI:1.1-1.96) (Fig. 3).

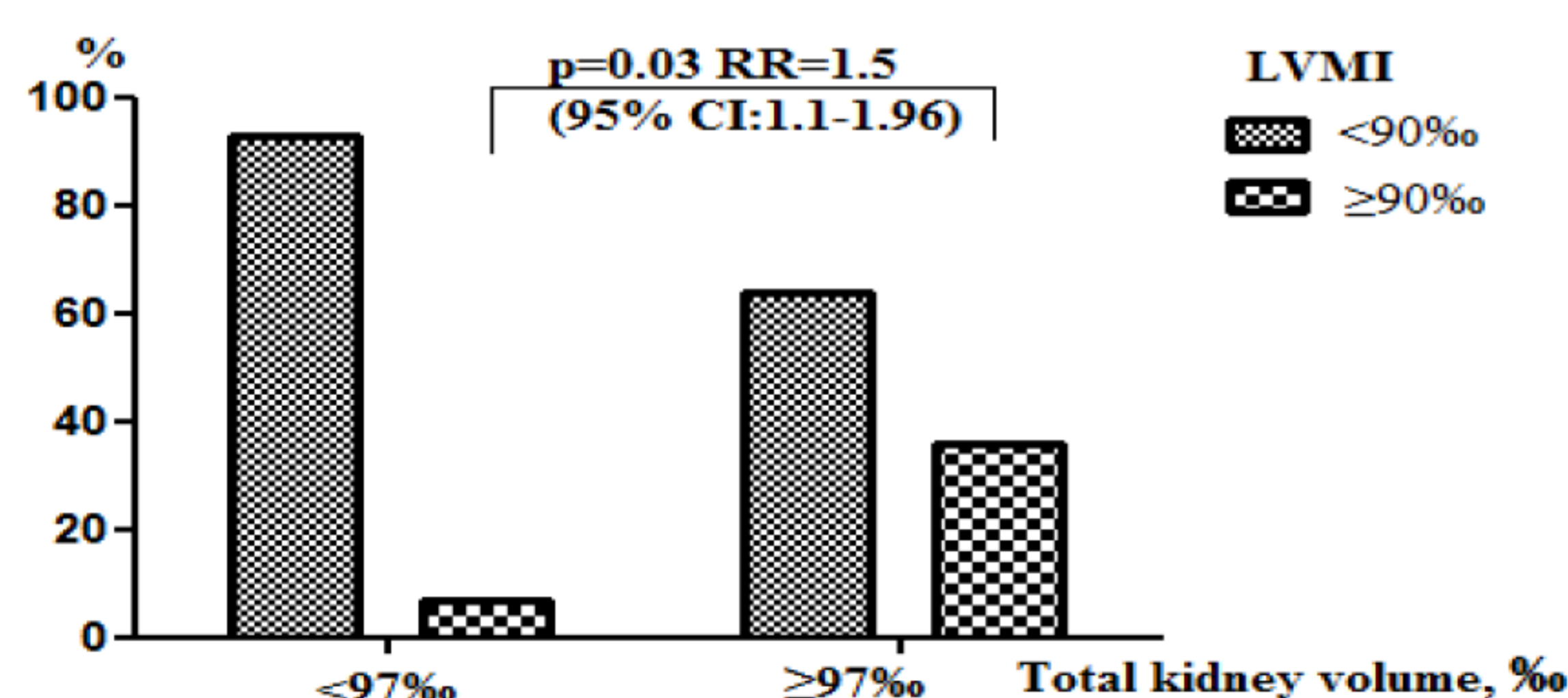


Fig.3 Frequency LVMI≥90% depending on the total volume of the kidneys

Conclusions:

Children with ADPKD and hypertension have larger kidney volumes as compared with their counterparts with normotension. There is a significant association between LVMI and renal volume.

