

# ECHOCARDIOGRAPHY PARAMETRES IN CHILDREN WITH CKD STAGES 3-5

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**INTRODUCTION:** Cardiovascular disease is the main cause of the high mortality rate in children with CKD. Hypertension is one of the symptoms and a factor contributing to the cardiac and large vessels abnormalities.

**AIM:** To estimate the prevalence of cardiac changes according to echocardiography and their association with blood hypertension in children with CKD stages 3-5.

## METHODS

### PATIENTS:

42 aged 1-17.5 years (20 girls, 22 boys)

CKD stage 3-4 - 14 pts

CKD stage 5 in 28 (7 - haemodialysis, 21 – peritoneal dialysis)

### PARAMETERS:

Blood pressure (BP) with calculation of systolic (SBP) and diastolic (DBP) Z-score by pediatric on-line calculator (QuesGen System Inc, 2015)

Echocardiography parameters (Voluson E8): left ventricle (LV) end-diastolic and end-systolic volumes (EDV and ESV), stroke volume (SV), ejection fraction (EF), the thickness of myocardium, diameter of the aorta, diastolic blood flow parameters to exclude diastolic dysfunction (E/A <1,48).

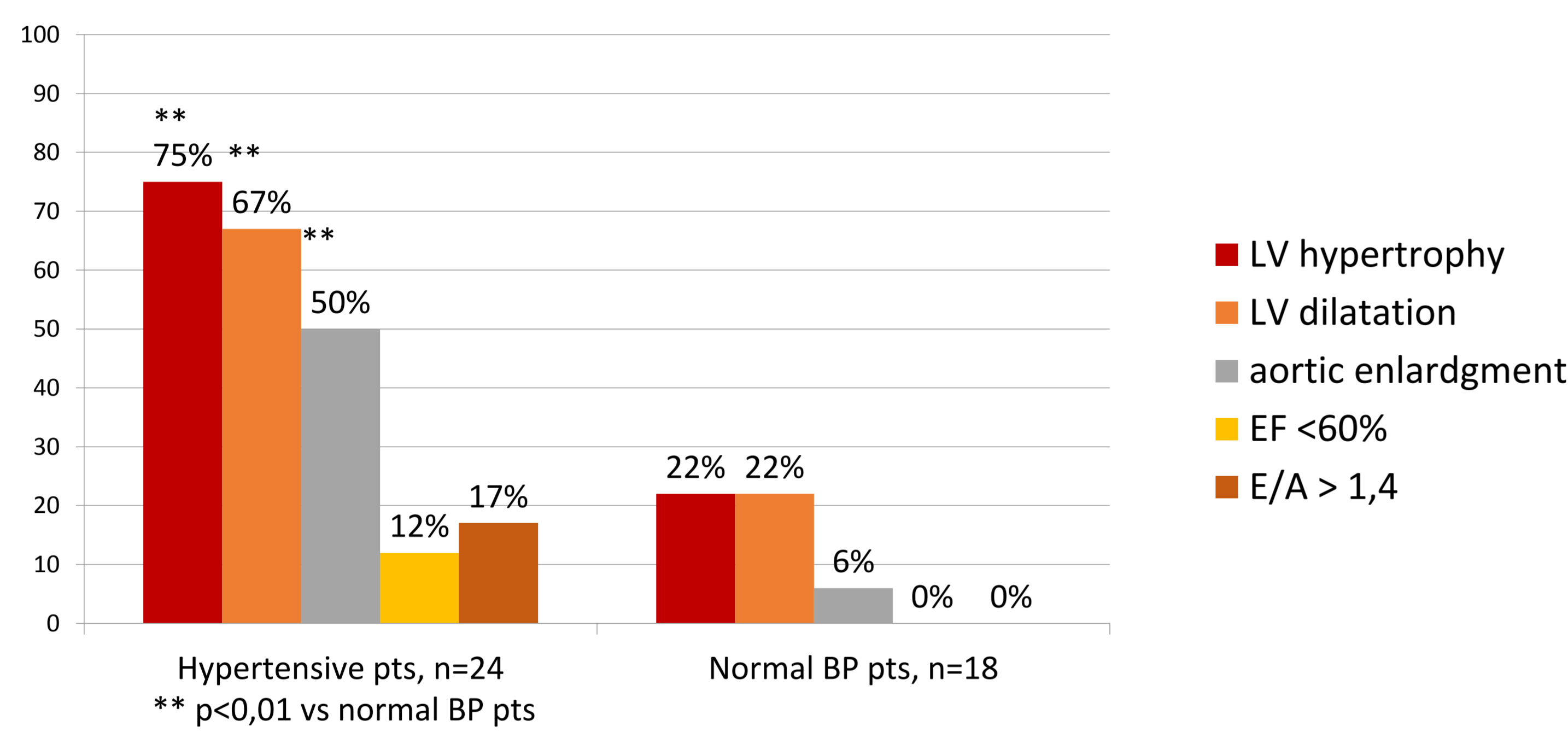
LV volumes were indexed to body surface area

## RESULTS:

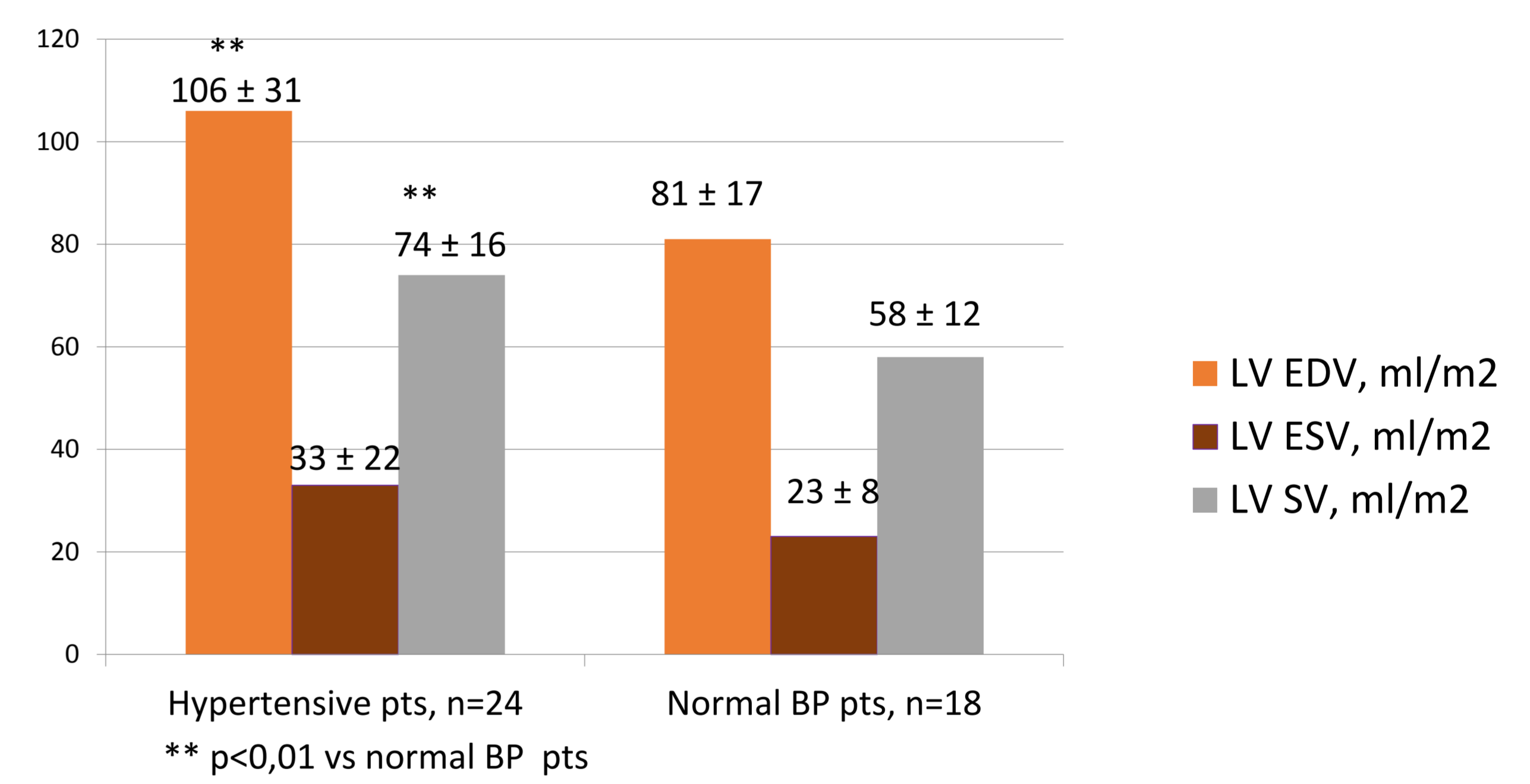
- Hypertension (Z score SBP and/or DBP > 2) was detected in 57% patients, regardless of the stage of CKD.



- In hypertensive children (n=24) vs patients with normal BP (n=18) more often abnormal cardiac parameters were detected by echocardiography:

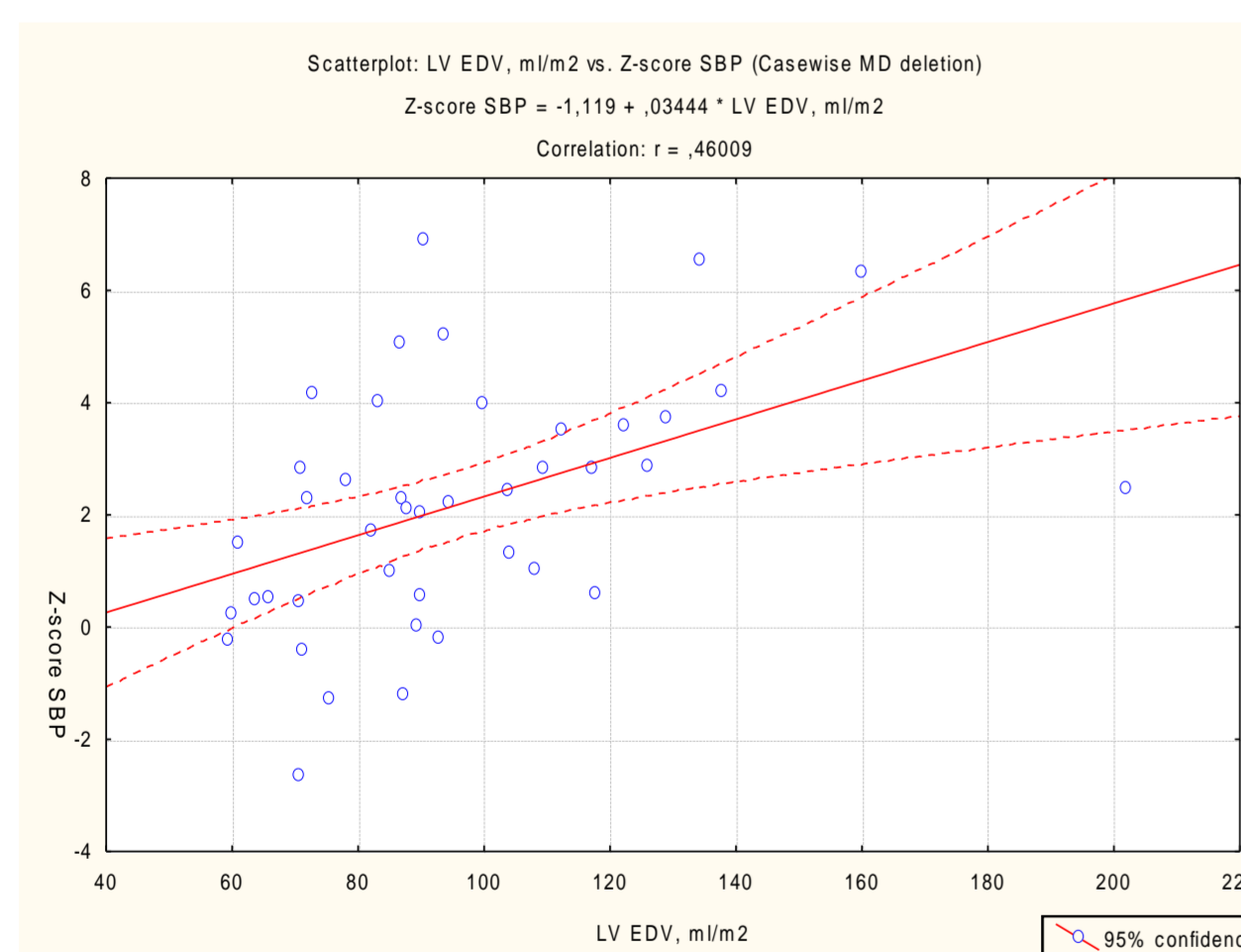


- In hypertensive children (n=24) vs patients with normal BP (n=18) ultrasound LV volumes (M ± σ) were significantly higher. That might be considered as the sign of volume overload.

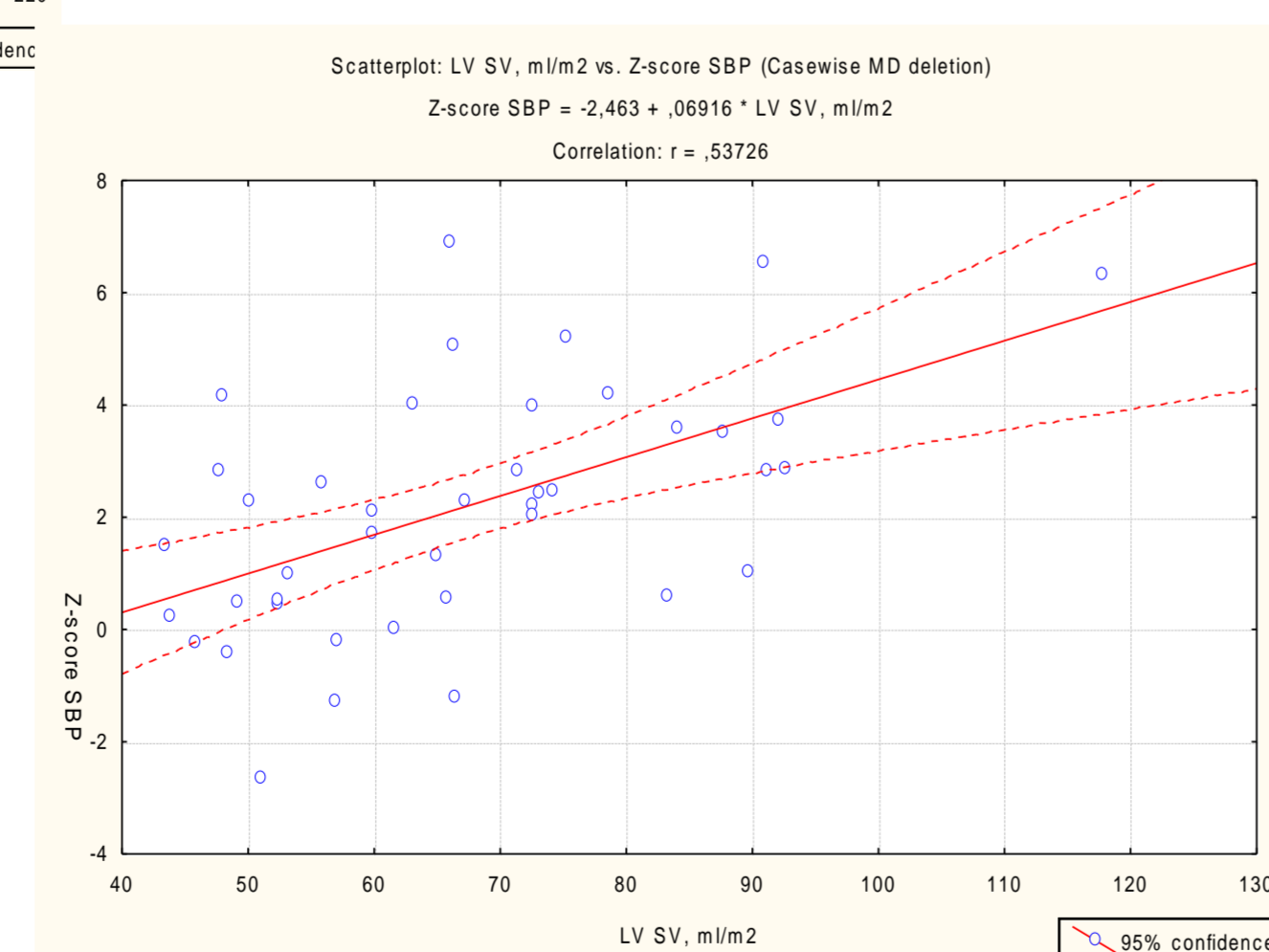


- Direct correlations were found of Z-score SBP and DBP vs LV EDV and LV SV.

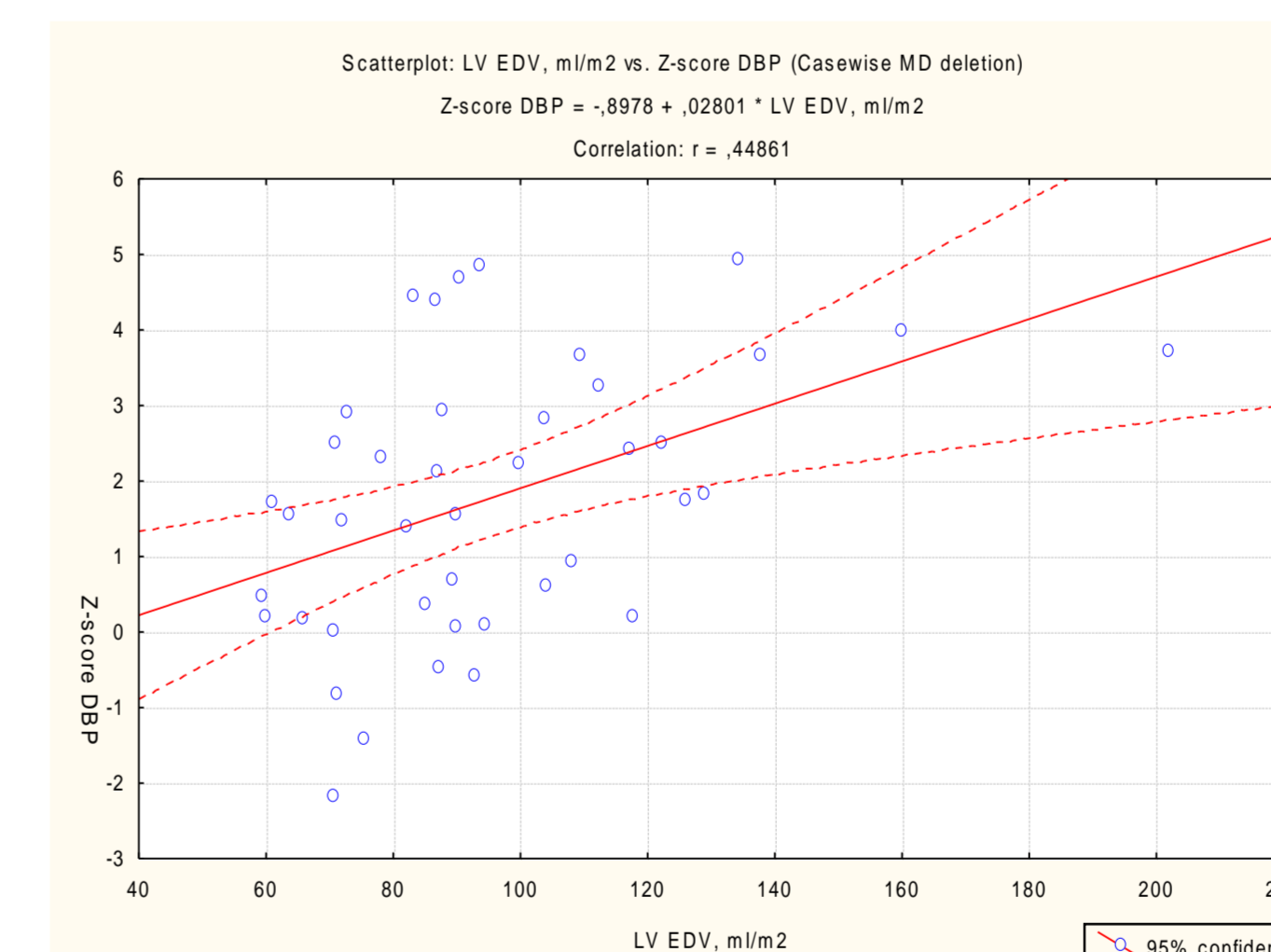
Z-score SBP vs LV EDV (r=0,46, p=0,002)



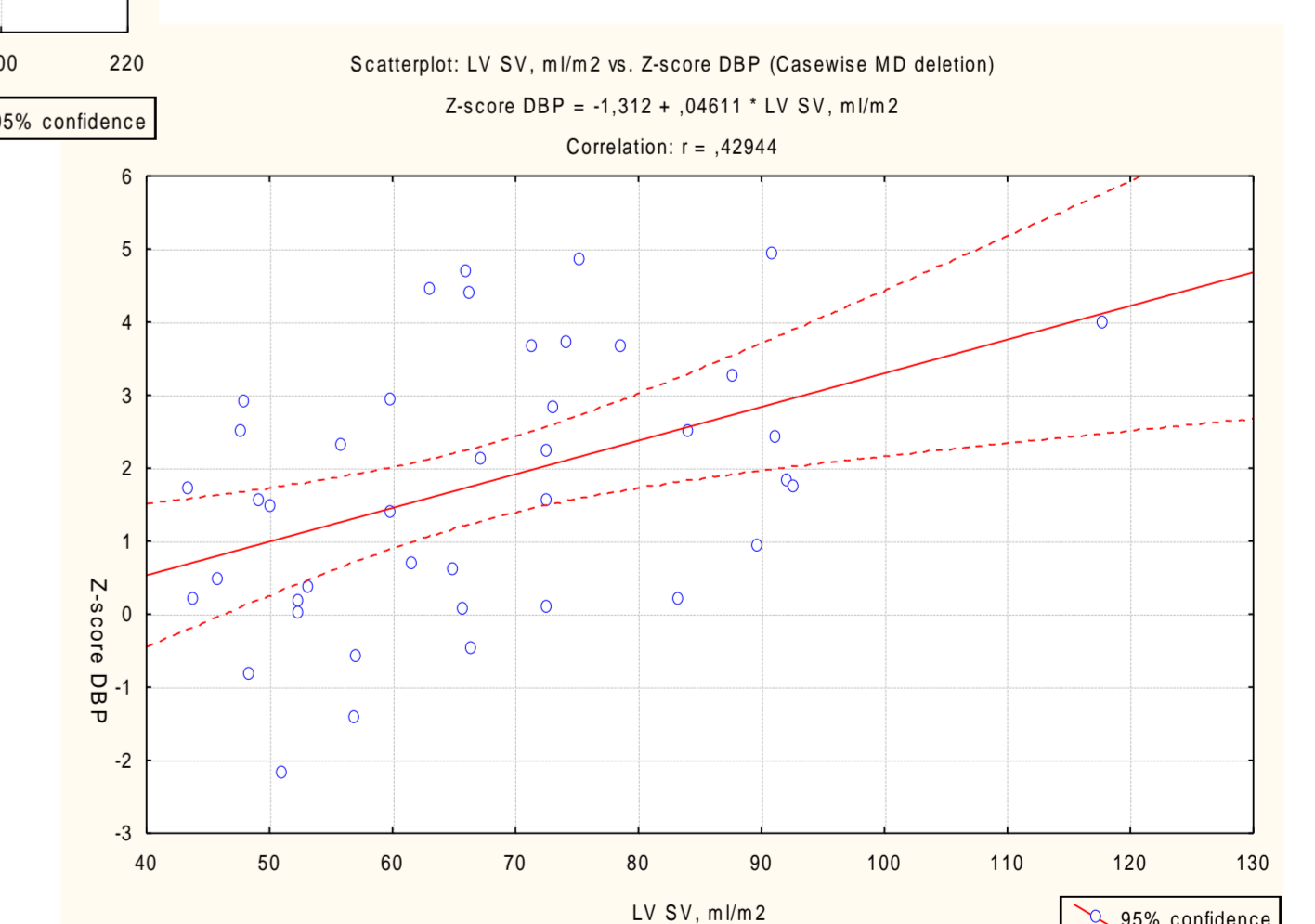
Z-score SBP vs LV SV (r=0,54, p=0,000)



Z-score DBP vs LV EDV (r=0,45 p=0,003)



Z-score DBP vs LV SV (r=0,43, p=0,003)



**CONCLUSIONS:** The high prevalence of LV hypertrophy and/or dilatation (in 75% of hypertensive children with CKD stages 3-5), aortic root enlargement (in 50%) confirms the presence of cardiovascular disease in this group. Volume overload may contribute significantly to blood hypertension in CKD children. Normal BP in CKD children does not exclude cardiovascular disease, as heart abnormalities were detected in 22% of these patients.

## REFERENCES

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