

# ENZYME VALUE IN CHILDREN WITH CHRONIC PYELONEPHRITIS AND DISMETABOLIC NEPHROPATHY



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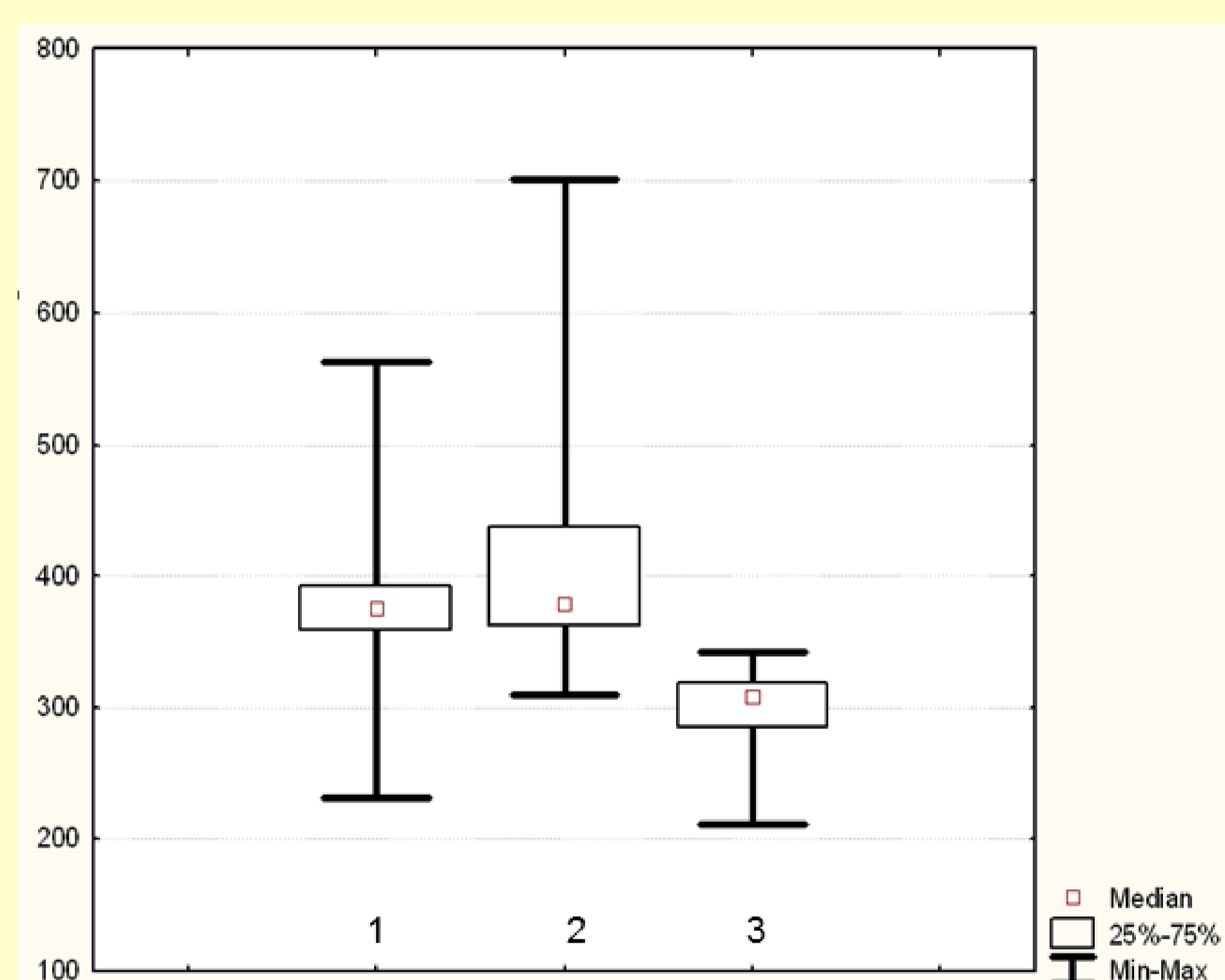


## INTRODUCTION AND OBJECTIVES

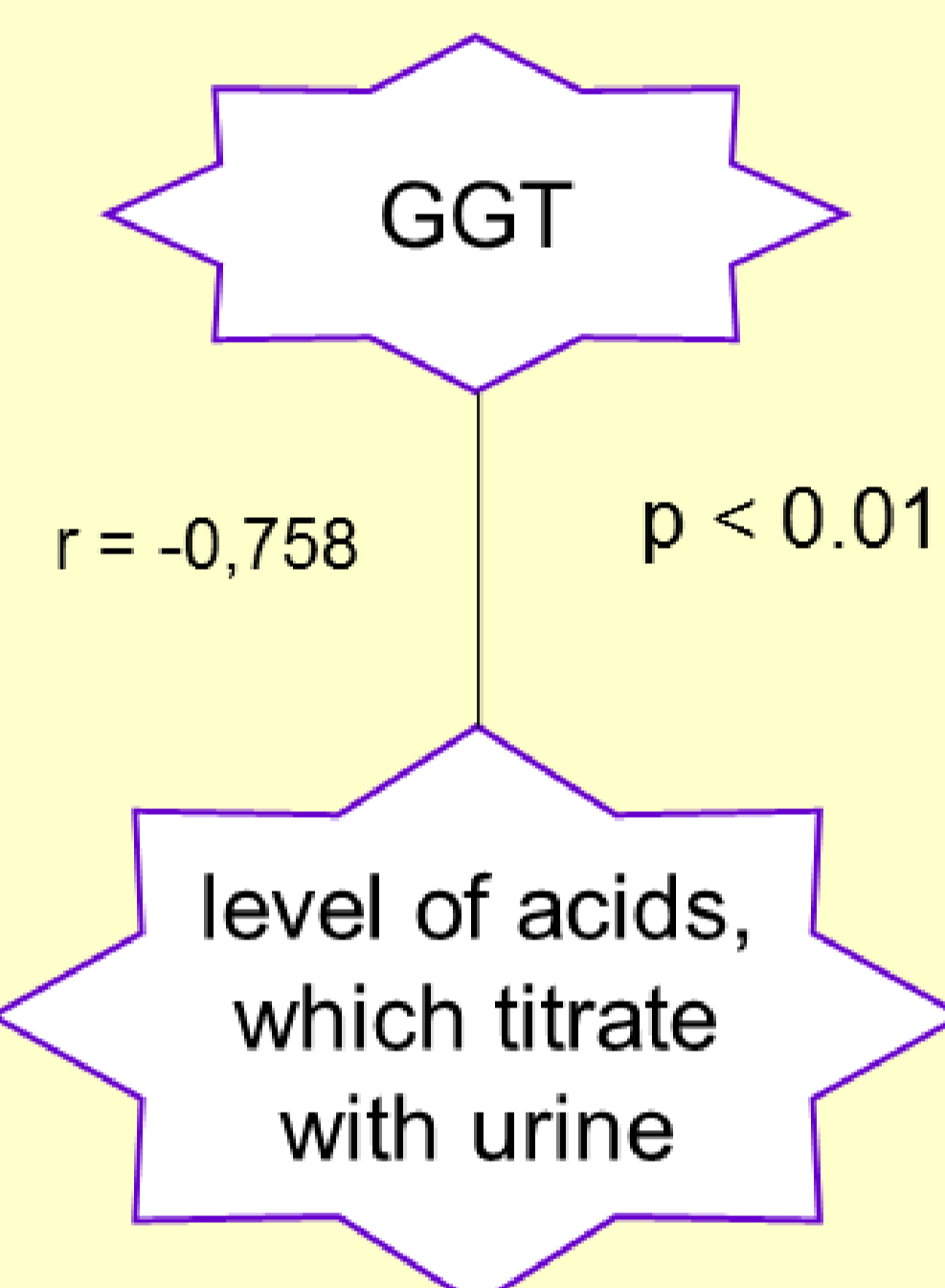
In Ukraine, there is a growing index of prevalence and incidence of disease of kidneys and urinary tract diseases among children. Pyelonephritis and dismetabolic nephropathy are leading among them. These pathological conditions attributed to risk factors for progression of chronic kidney disease toward chronic renal failure. It remains important to find early markers of progression of chronic kidney disease.

**Objective:** improve early diagnosis of tubular renal dysfunction in children with chronic kidney disease and dismetabolic nephropathy by examining the urine of various intracellular localization of enzymes.

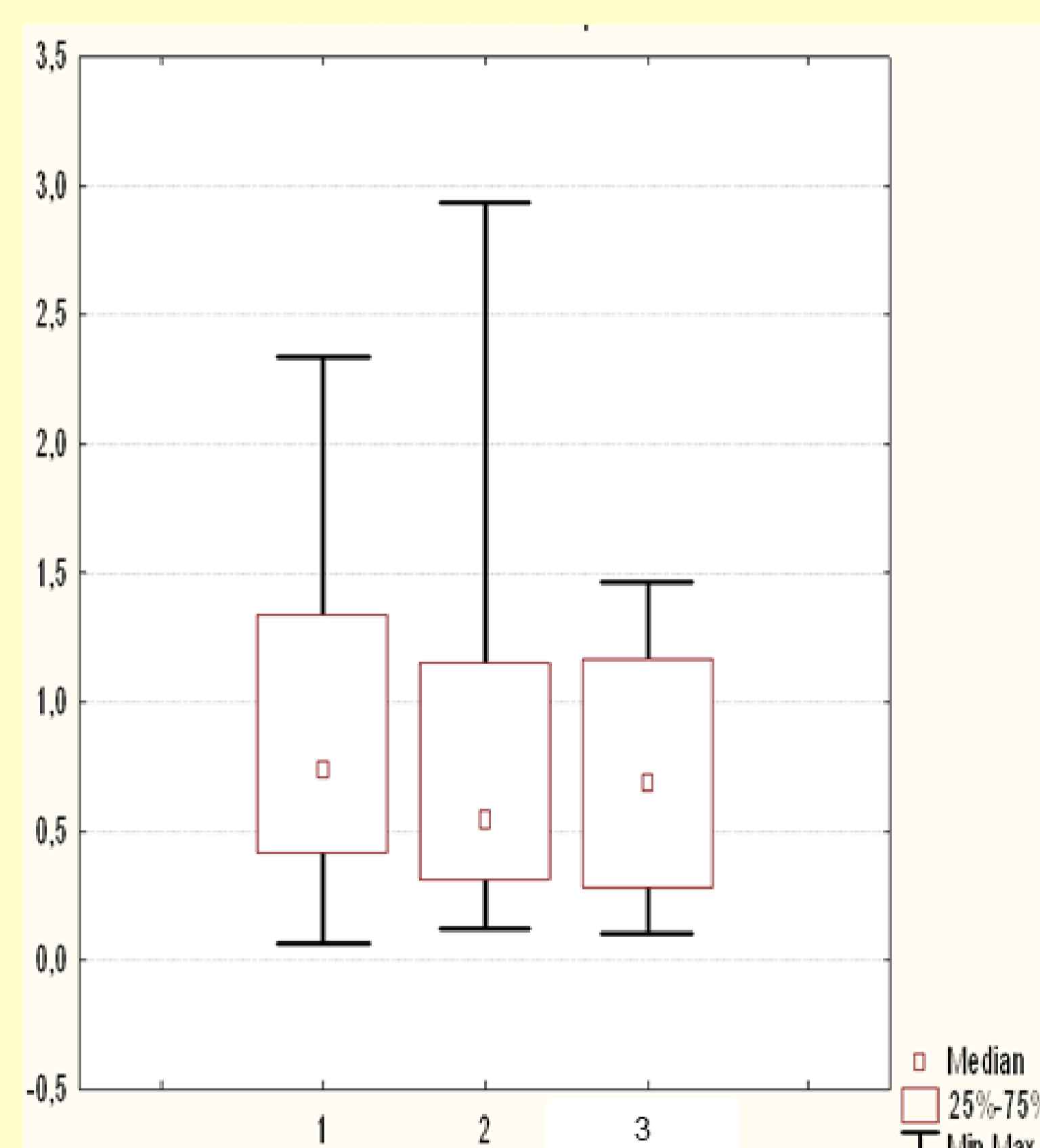
### GGT levels in the urine of children survey



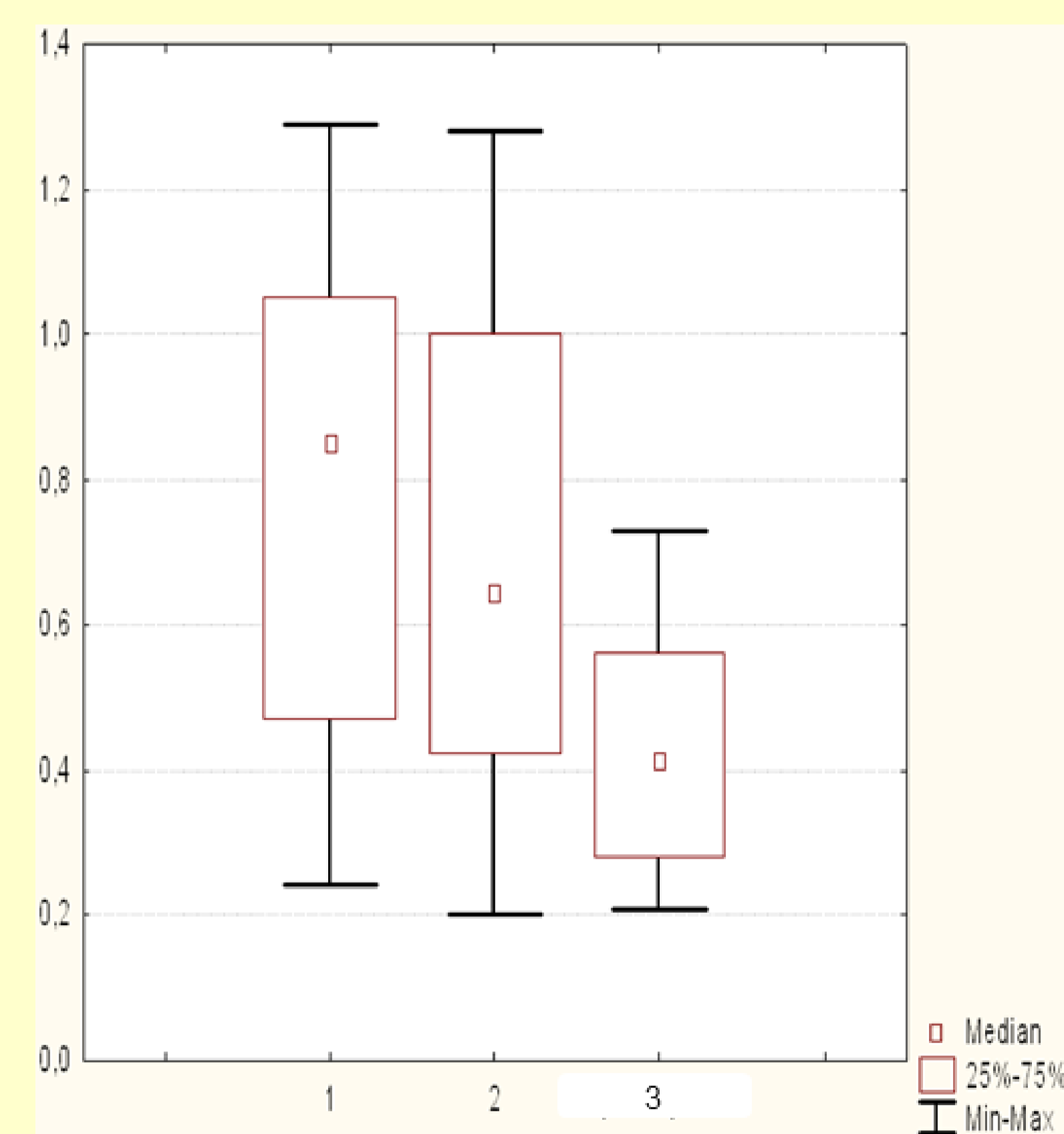
### the 1<sup>st</sup> group



### Aph and SDG levels in the urine of children survey



ALP



SDG

## METHODS

The study involved 80 children (31 boys and 49 girls) from 6 to 17 years old with chronic kidney disease stages I and II. The first group included children with dismetabolic nephropathy (n = 40), the second group included children with chronic pyelonephritis and concomitant dismetabolic nephropathy (n = 40). The control group consisted of 22 healthy children without any chronic disease, in the representative age.

We determined activity of reospetsyfic enzymes for early detection of renal dysfunction, the degree of structural and functional abnormality nephron elements.

We determined  $\gamma$ -glutamyltransferase (GGT) and alkaline phosphatase (ALPh) as a marker of cytomembranes proximal kidney tubular epithelium cells damage. As a marker of deep affection of mitochondrial apparatus, namely the proximal twisted tubules, determination of succinate dehydrogenase (SDG) and acid phosphatase (APh) in urine were performed using photometric and kinetic methods. On spectrophotometer SF-46 with a range of 190-1100 nm steps. We used Statistical package "STATISTICA 7.0 FOR WINDOWS" to prepare statistical analysis. Non-parametric statistical methods are presented by median (Me) and interquartile scale (Lq; Uq).

## RESULTS

Urine GGT level was statistically higher in both groups of children compared with controls ( 375.6 ( 359.3; 392.0 ) and 375.6 ( 359.34; 432.8 ) versus 308.2 ( 258.8, 310.5 ) nmol/s/l. ( p < 0.001)). The level of ALPh in urine was statistically higher in children of both groups compared with the control ( 4.99 ( 2.6, 7.8 ) and 3.24 ( 2.4, 5.1 ) versus 1.24 ( 0.58; 1.79 ) mmol/s. MM.kr. ) ( p < 0,001)). SDG level was statistically higher in both groups of children compared with the control ( ( 0.85 ( 0.47, 1.05 ) and 0.64 ( 0.42, 1.00 ) versus 0.41 ( 0.28, 0.56 ) mmol / min / ml ) ( p < 0.05)). Level APh in the urine of both groups was not statistically different from the control group ( ( 0.74 ( 0.42, 1.34 ) and 0.54 ( 0.31 , 1.15 ) versus 0.69 ( 0.28, 1.16 ) mmol / min / ml ) ( p > 0.05)). Established probable correlative relationship of GGT levels in the 1<sup>st</sup> group of children with the level of acids, which titrate with urine ( r = 0,758, p < 0,05 ), the second group of children with urinary oxalate levels ( r = 0,523, p < 0,05 ).

## CONCLUSIONS

In children with chronic pyelonephritis and dismetabolic nephropathy we observed abnormal fermenturia as increased levels of GGT, ALP and SDG in urine. Elevated levels of said enzymes in urine should be considered as potential markers of tubular function disorder.

## References

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