Introduction. Nephrotic syndrome (NS) is a kidney disease characterized by albuminuria, hyperlipidemia, edema, and hypoalbuminemia. Recent data shown that more than 80% of children with nephrotic syndrome respond to steroid treatment, remain steroid-sensitive during subsequent relapses, and consequently have a favorable long-term prognosis. Steroid resistance is believed to be associated with a high risk of developing chronic renal failure. Recent reports suggest different clinical, genetic and molecular markers to be accompanied with phenomenon of steroid resistance. However, molecular markers controlling apoptosis and hydronephrosis have not been studied as a predictors of steroid resistant NS (SRNS) and steroid sensitive NS (SSNS).

Aim of the study. To identify clinical and molecular markers of the steroid-resistance phenomenon in children with NS.

Methods We analyzed 56 clinical cases of children hospitalized in Pediatric Hospital №7 (Kyiv, Ukraine) with NS (26 SSNS and 30 SRNS). Clinical data (age, gender, disease duration, blood pressure), conventional laboratory markers (serum creatinine, serum urea, GFR, blood WBC, PLT), markers of apoptosis (BeL-xL, caspase-3, caspase-8, NF-kappa B) analyzed.

Stepwise logistic regression models use to identify candidates with the potential to be related to have influence of steroid resistance in children with NS. Data processed using GraphPad Prism 9.0 Software for Windows (USA, San Diego, CA).

Results Stepwise logistic regression models identified arterial hypertension as a candidate among clinical characteristics (β: -0.3057; SE: 0.1487; 95% confidence interval [CI]: -0.6042 to -0.007281, p<0.05) as a candidate predictive of SRNS.

Among conventional clinical markers Serum creatinine (OR: 1.04; 95% CI: 0.95–1.1), Serum urea level (OR: 1.03; 95% CI: 0.83–1.3), WBC level (OR: 1.4; 95% CI: 1.1–1.8) identified as candidates predictive SRNS.

In addition, logistic regression analysis identified BeL-xL (OR: 1.3; 95% CI: 1.1–1.5) and caspase-3 (OR: 1.5; 95% CI: 1.2–1.9) as a markers controlling apoptosis and predisposing SRNS.

Conclusion Arterial hypertension, Serum creatinine level, Serum urea level, WBC count, BeL-xL and caspase-3 levels indentified as candidate biomarkers to predict SRNS in pediatric NS.

We analyzed children with urolithiasis with age- and gender-matched healthy children as a successful resolution test to ascertain any differences in urinary stone formation.

The study was conceived as a retrospective analysis of urinary stone disease in children from different parts of Croatia who had been treated for at least one urinary stone occurrence. For the urine samples to reflect a natural nutrient and fluid intake, the children were on a free diet. For the measurement of Ca, Ox, Cit, and creatinine, 24-hour urine collection was performed three days in a row. We used 24-h samples instead of 2-h mornings or 12-h urine samples to acquire Ca, Ox, Cit, GAGs, and creatinine excreted in urine as accurately as possible. Urine excretion of Ca (mmol/mmol creatinine), Ox (mmol/mol cr), Cit (mmol/mol cr), GAGs (mg/mmol cr), Ca/Cit (mol/mol), Ox/GAGs (mmol/g), Ox/Cit (mmol/mol), Ox/(Cit×GAGs) (mol Ox × mol cr)/(mol Cit × g GAGs), and Cit/GAGs (mmol/g) were analyzed. Data analysis was performed by using Statistica for Windows version 8 and GraphPad Prism version 5. Additionally, J48 classifier was used to construct classification model for discrimination between subgroups Calcium (mmol/mmol creatinine) and the calcium/citrate ratio (mmol/mmol) are the only variables that differentiate children before puberty from healthy children (ROC analysis confirmed only calcium/citrate as a significant variable with cut-off value > 0.84).

Pubertal/postpubertal children are distinguished from age- and gender-matched healthy children by the following variables: citrate (mmol/mol creatinine), calcium/citrate (mol/mmol), oxalate/glycosaminoglycans (mmol/g), oxalate/calcium ratios (mol/mmol) and oxalate/(citrate × glycosaminoglycans) (mol oxalate × mol creatinine)/(mol citrate × g glycosaminoglycans), all were confirmed by ROC analysis with cut-off values ≤ 327.87, > 1.02, > 11.24, > 0.12, > 0.03, respectively.

These results indicate a different risk of urinary stones development before puberty vs. pubertal/postpubertal children and increasing importance (deficiency) of citrate and glycosaminoglycans in such children. J48 classifier confirmed the importance of the oxalate/(citrate × glycosaminoglycans) and the calcium/citrate ratios with the practically applicable classification tree for distinguishing between pubertal/postpubertal children with urolithiasis with age- and gender-matched healthy children.
A Study was done to analyse the reliability of point of care urinalysis done at Mater Dei Hospital Paediatric Emergency Department, which is the main hospital in Malta.

Data was collected over a 6 week period, starting from the 18th of January 2021. Reliability was assessed through comparison of the result from the point of care test to the result from the laboratory.

Furthermore if there was evidence of a Urinary Tract Infection (UTI) a urine culture and sensitivity test was performed. Data was collected by going through the documentation of all the patients that attended the Paediatric Emergency Department during that time period.

If urine was collected for urinalysis and tested by both point of care urinalysis and official laboratory urinalysis, this included the data. In the presence of evidence of a UTI data regarding the culture and sensitivity was recorded. The data obtained from the laboratory was then converted to the same units as those obtained from the urinalysis done at the Paediatric Emergency Department. These were then compared and a Chi squared test was performed obtaining a P value for each of the subset of data collected.

Null Hypothesis – ‘There is no significant difference in the values obtained from a urinalysis done at the Paediatric Emergency department and that done at the Laboratory’

P values obtained for each category were as follows:

- Leukocytes - 0.757
- Nitrites - 1
- Proteins - 0.312
- Erythrocytes - 0.766
- Ketones - 0
- Glucose - 1

The Null hypothesis could be accepted for Leukocytes, Nitrites, Proteins, Erythrocytes and Glucose and rejected for ketones with a confidence of p = 0.05.

A point of care urinalysis performed at the Paediatric emergency department is reliable to determine the presence and give a measure respectively of WCC, erythrocytes, protein and glucose. It is also reliable to detect nitrites.

The identification and quantification of ketones from a urinalysis at the Paediatric Emergency department should be backed up by a formal urinalysis performed by the laboratory.