

ACT and leg-ACT was  $78\% \pm 12$  [95% CI, 73–83] and group 2:  $85\% \pm 10$  [95% CI, 81–89]. ACT activity threshold setting did not have an impact on the results.

**Conclusions** ACT recording, a few days after birth, is not a reliable method for sleep pattern studies in preterm and term neonates.

## Nephrology

### PS-234 ADVANCED OXIDATION PROTEIN PRODUCTS IN CHILDREN WITH NEPHROTIC SYNDROME

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**Background and aims** Advanced oxidation protein products (AOPP) represent an exquisite marker of oxidative stress, their role in the pathophysiology of chronic renal failure might be of great importance. The aim of the study was to determine serum and urinary levels of AOPP in children with nephrotic syndrome (NS).

**Methods** The study included 40 children, aged 12 to 18 years, of whom 25 were diagnosed with acute NS, 8 children with chronic NS and 7 children with chronic kidney disease (CKD) stage 3–5. The control group consisted of 20 healthy children. Assessment of the serum and urinary excretion of AOPP was based on spectrophotometric detection method (Kalousova M. *et al.*, 2002).

**Results** Serum AOPP level in children with acute NS constituted  $24,40 \pm 4,27$  mM/l compared to controls ( $36,91 \pm 3,86$  mM/l), however urinary excretion of AOPP was significantly higher ( $31,1 \pm 4,6$  mM/l vs.  $12,14 \pm 2,7$  mM/l in controls;  $p < 0,05$ ). In the group of children with chronic NS serum and urinary levels were higher but not significantly as compared to controls ( $54,70 \pm 7,6$  mM/l and  $22,46 \pm 3,2$  mM/l, accordingly;  $p > 0,05$ ). A remarkable increase of the serum excretion of AOPP in CKD stage 3–5 was noted ( $130,5 \pm 22,83$  mM/l;  $p < 0,05$ ).

**Conclusions** The determination of AOPP in serum and urine is a reliable marker to estimate the degree of oxidant mediated protein damage in patients with nephrotic syndrome and to assess the progression of chronic kidney disease.

### PS-235 THE EFFECTS OF RESPONSE GENE TO COMPLEMENT 32 AS A NEW BIOMARKER IN CHILDREN WITH ACUTE KIDNEY INJURY

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**Background and aims** To investigate the new biomarkers of acute kidney injury, as well as to conform the values of response gene to complement-32 (RGC-32) protein for early diagnosis of acute kidney injury in children who had undergone cardiopulmonary bypass (CPB).

**Methods** 67 patients accepted CPB assigned to acute kidney injury group (AKI group) or non-acute kidney injury group (non-

AKI group). Serum samples were taken regularly after CPB 30 min, 2 h, 4 h, 24 h, 48 h and 72 h for serum RGC-32, creatinine (Scr) and Cystatin C (CysC) measurement.

**Results** The incidence of AKI was 34%, including 15 cases with Risk stage AKI, 4 cases with Injury stage AKI, 3 cases with Failure stage AKI, 1 cases with Loss stage AKI. The values for sensitivity of serum RGC-32 after CPB 30 min, 2 h and 4 h as 0.914, 0.824, 0.824 and the values for specificity of serum RGC-32 as 0.619, 0.667, 0.810, respectively.

**Conclusion** In this study, our results first identify that possibly the sensitivity of serum RGC-32 for detecting AKI are much higher than that of Scr and serum CysC in children who had accepted CPB, and that RGC-32 may be a new biomarker for early detection of AKI. However, the conclusion needs to be further elucidated.

### PS-236 ADVANCED GLYCATION END PRODUCTS AND CARDIOVASCULAR AND RENAL PARAMETERS IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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**Introduction** Advanced glycation end products (AGE) are increased in many tissues during ageing. AGE are involved in cellular and endothelial damage in diabetes, chronic kidney disease (CKD) and cardiovascular disease. Increased levels, measured by skin autofluorescence (AF), are associated with the risk of cardiovascular events in adult patients with end-stage CKD. A high level of AF is a marker of progression of chronic kidney disease in adults with CKD at stage 3. We estimated the accumulation of tissue AGEs and looked for correlations of skin AF with markers of cardiovascular risk and progression of renal disease in children with CKD over a 2 years period.

**Methods** A cross-sectional pilot study compared 14 children with stage 3–5 CKD with a control group of children with the same age. We analysed associations between skin AF and markers of cardiovascular function, and with the progression of CKD.

**Results** The skin AF values were significantly higher ( $p < 0.01$ ) in CKD children than in controls. In CKD children, skin AF was significantly associated with intima-media thickness of the common carotid artery ( $p = 0.01$ ) and showed a trend with ambulatory blood pressure over 24 h ( $p = 0.06$ ). Finally, skin AF was associated with changes in the glomerular filtration rate after 2 years of follow-up ( $p = 0.03$ ).

**Conclusion** Noninvasive measurement of tissue accumulation of AGE by skin AF could be, in a near future, a useful tool in the assessment of cardiovascular risk and progression of chronic kidney disease in children with renal impairment.

### PS-237 CONTRAST-ENHANCED VOIDING UROSONOGRAPHY WITH A SECOND-GENERATION ULTRASOUND CONTRAST AGENT FOR DIAGNOSIS OF VESICoureTERIC REFLUX IN 1350 CHILDREN: THE EXPERIENCE OF A SINGLE CENTRE

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**Purpose** To evaluate the diagnostic performance and safety of intravesical administration of a-second-generation ultrasound contrast-agent (UCA) for the diagnosis of vesicoureteric reflux (VUR) in children.

**Methods and materials** 1350 children (587 boys/763 girls, mean-age 2.6y, range 15d-17y) with 2720 pelvi-ureter-units, underwent contrast-enhanced voiding urosonography (ceVUS) to rule out VUR and urethral pathology. A second-generation UCA (SonoVue®, Bracco, Milan) was administered intravesically through 5–8F feeding-tube at a dose of 0.5 ml/bladder filling. Possible adverse-events were monitored during the examination and followed-up for 7 days after the ceVUS by phone-calls. Urine analysis and culture were performed 3–5 d before ceVUS in all children and 24–48 h in any patient reported with adverse-events.

**Results** VUR was detected in 450/1350(33%) patients (162 boys/288 girls). This was in 653 pelvi-ureter-units (reflux-grade distribution: grade I = 1, grade II = 276, grade III = 266, grade IV = 100, grade V = 10). The urethra was normal in all children. Mean duration of examination was  $14 \pm 7$  min, including urethral imaging. Minor adverse-events were reported in 45 (3.3%) children. These included dysuria (n = 39), abdominal pain (n = 2), increased frequency of micturition (n = 1), vomiting (n = 1), perineal irritation (n = 1), and urinary-tract-infection after ceVUS (n = 1). The onset of adverse-events were subacute in 92% and delayed in 8% and were self-limited non-requiring hospitalisation.

**Conclusions** There were no serious adverse-events with intravesical use of SonoVue®. Only a few minor adverse-events were reported during ceVUS most likely due to catheterization process. Thus ceVUS with intravesical administration of a second generation UCA (SonoVue®) for VUR and urethral pathology detection is a safe and reliable diagnostic procedure in children.

#### PS-238 STUDY OF BONE BIOCHEMICAL MARKERS AND THE CYTOKINE SRANKL/OPG SYSTEM IN CHILDREN WITH IDIOPATHIC HYPERCALCIURIA

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**Background** Idiopathic Hypercalciuria (IH) has been associated with decreased bone density up to 30% of the children.

**Aims** To determine the concentrations of cytokines osteoprotegerin (OPG) and sRANKL and other biochemical indices of bone metabolism in children with IH.

**Methods** In 31 children of median age 6.3 years (range 2.2–16.4) with IH OPG, sRANKL, 25(OH)D, 1,25(OH)<sub>2</sub>D, PTH, Ca, Pi, osteocalcin, ALP and CTx-Crosslaps were determined in serum and Ca/Cr, oxalate/Cr and citrate/Cr in urine. Times of study were at diagnosis and after 3 months of salt free and adequate Ca diet. Height and BMI z-score were assessed. Clinically healthy children (n = 35) matched for age/sex and season were used as controls (median 7.8 years, range 1.8–16.3).

**Results** Although urinary Ca excretion (24 hCa and UCa/UCr) decreased at 3 mo (p < 0.05 and p < 0.01) on average it had not reached control values (p < 0.0001, p = 0.0004). No significant differences were found for urine excretion of citrate and oxalate

or for serum Ca, Pi, 25OHD, 1,25(OH)<sub>2</sub>D, PTH, osteocalcin, ALP, OPG, sRANKL and sRANKL/OPG ratio in patients before and after diet or compared to controls. Only serum concentrations of CTx-Crosslaps were significantly higher in both patient samples (p < 0.02, p < 0.05) than controls. The BMI z-score was lower in patients than controls (p = 0.016), but height did not differ.

**Conclusion** Although serum OPG/sRANKL and osteocalcin were not different in children with IH, the higher serum CTx-Crosslaps levels (bone resorption index) may suggest bone turnover uncoupling with an autocrine role of the above cytokines.

#### PS-239 EARLY ACUTE RENAL INJURY VERSUS LATE ACUTE RENAL INJURY. ARE THERE ANY PROGNOSTIC DIFFERENCES BETWEEN THEM?

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**Objectives** To evaluate the clinical differences between patients developing early acute kidney injury (EAKI) and late acute kidney injury (LAKI) during their stay in a PICU.

**Methods** Retrospective study including patients admitted to the PICU over the last 4 years. Children were excluded if they had a length of stay of less than 2 days or if they had end stage renal disease. AKI was defined according to the KDIGO criteria. The episodes of AKI that began within the first 72 h of admission were considered early AKI (EAKI), and those that appeared later were considered LAKI.

**Results** 1082 patients fulfilled the inclusion criteria. 415 patients (38.3%) developed AKI: EAKI 354 patients (173 had stage I AKI, 77 stage II and 104 stage III); 61 patients LAKI (33 stage I, 15 stage II and 13 stage III). The severity and duration of the AKI, the need for dialysis and the incidence of pre renal AKI were not different between EAKI and LAKI groups. Patients with LAKI had more time of mechanical ventilation (156 h vs 72 h, p0.006) and a longer PICU stay (13 vs 7 days, p < 0.001). There were no differences in age or mortality between groups. LAKI was found to be more frequent in post-operative cardiac patients (41%) (p < 0.001).

**Conclusions** LAKI is associated with more time of MV, longer PICU stay and with the cause of admission to the PICU. However LAKI is not associated with greater severity or mortality than EAKI.

#### PS-240 DEVELOPING A TOXIC PAEDIATRIC ANIMAL MODEL OF NON-OLIGURIC ACUTE RENAL INJURY WITH CISPLATIN

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**Introduction** Developing a non-oliguric paediatric animal model of acuterenal injury (AKI) could be useful to study the evolution of diuresis after treatments. Cisplatin causes a dose-dependant poliuric renal failure in humans. A dose of 5 mg/kg has been used in rats to produced AKI but there are no studies in pigs.