Methods: A retrospective chart review on hyperfiltration injury markers was performed in 232 children (117 with a congenital SFK, 115 with an acquired SFK), divided into six groups based on the SFK origin. A prediction model for estimated glomerular filtration rate (eGFR) by Schwartz-formula was developed for every diagnosis group using generalized estimated equation (GEE)-analysis. GEE-analysis utilizes all data available and is capable of handling irregular time intervals and corrects for the dependency of observations.

Results: Hyperfiltration injury, defined as the presence of hypertension, the use of antihypertensive agents and/or the presence of (micro-)albuminuria, was prevalent in 44.8% of the children with a SFK at a mean age of 9.6 yrs (SD 5.7). No differences in the prevalence of hyperfiltration injury were found between children with a congenital SFK and children with an acquired SFK. In all groups, GEE-analysis showed a decline in eGFR from the beginning of puberty onwards.

Conclusions: Glomerular hyperfiltration injury is present at a young age in children with a SFK, irrespective of the origin. In combination with our prediction model, these children are at increased risk to develop chronic kidney disease later in life. Therefore follow-up of children with a SFK is needed.

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THE INFLUENCE OF ERYTHROPOIETIN AND HYPOTHERMIA ON THE DAMAGED KIDNEYS OF RATS WITH PERINATAL ASPHYXIA

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Objectives: The aim of this research was to determine the effects of erythropoietin, hypothermia and a combination thereof on the damaged kidneys of rats with perinatal asphyxia.

Methods: Experimental animal population encompassed female and newborn Wistar rats. Perinatal asphyxia was induced by immersing the uterus containing fetuses into the water (38°C). The uterus was removed from the female rats by caesarean section, on the last day of gestation. The period of asphyxia until delivery of newborn rats has continued for 15 minutes. After birth, the newborn

rats were distributed into four groups of 15 animals: G1 - asphyxia; G2 - asphyxia + erythropoietin (2,5µg, intraperitoneally) + hypothermia (rectal temperature 32°C); G3 - asphyxia + hypothermia (rectal temperature 32°C); G4 - asphyxia + erythropoietin (2,5µg, intraperitoneally). The rats were sacrificed on day 7 of life and histo-pathological evaluation of kidney preparations was performed.

Results: The results revealed that damage of proximal tubules was significantly higher than that of the distal tubules ($p < 0.01$). Statistically significant differences were established with respect to damage of proximal tubules in group G1, which were significantly higher as compared to the group G2, as well as to groups G3 and group G4 ($p < 0.01$). The zone of immature glomeruli in group G4 was significantly wider than that of the groups G1, G2 and G3 ($p < 0.01$).

Conclusions: Erythropoietin and hypothermia, as well as the combination thereof have a protective effect on rat kidney damaged during perinatal asphyxia. Moreover, erythropoietin also enhances maturation of immature kidney glomeruli.

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CONTINUOUS RENAL REPLACEMENT THERAPY AFTER CARDIAC SURGERY IN CHILDREN

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Objective: To study the evolution of children requiring continuous renal replacement therapy (CRRT) after cardiac surgery and to analyse factors associated with mortality.

Material and methods: Prospective observational study between 1996 and 2009 in children after cardiac surgery requiring CRRT. Univariate and multivariate analysis were performed to analyse the influence of each factor on mortality.

Results: Of the 1650 post-operative cardiac surgery patients admitted in the ICU between 1996 and 2009, 81(4,9%) required CRRT. 26% weighed less than 5 kg. Patients with CRRT after cardiac surgery had a mean arterial pressure, creatinine and urea at the beginning of the CRRT, significantly lower than other critically ill children with CRRT, and they needed mechanical ventilation more frequently.

There were no significant differences in the mortality risk scores PRISM, PIM y PELOD. Mortality of patients with CRRT after cardiac surgery was higher 43% than the mortality of the rest of patients 29% ($p=0,051$). Factors associated with mortality were age less than 12 months, weight less than 10 kg, hypotension, high PRISM score and low creatinine and urea at the beginning of the CRRT, and hemofiltration (without dialysis). In the multivariate study the only factor associated with mortality was the hypotension at the beginning of CRRT (Hazard Ratio: 4.01; CI 95%:1.2-13.4; $p=0.024$).

Conclusions: A 5 % of children after cardiac surgery require CRRT. Mortality of these patients is higher than other critically ill children who require CRRT. Hypotension at the beginning of the CRRT is the most important factor related to mortality.

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RENAL FUNCTION AND SIZE AT THE AGE OF 7 YEARS OF EXTREMELY LOW BIRTH WEIGHT INFANTS

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Background: Prematurity is considered to be an important risk factor of renal disorders in adulthood. However, there is little reliable evidence about the correlation between ELBW and the development of renal complications at school age.

Aim. Assessment of renal function, renal size and the risk of hypertension at the age of 7 years of the regional cohort of ELBW children born in 2002.

Material and methods: 40 children born as ELBW infants with mean birthweight 869g (SD:121) and mean gestational age 27.6 weeks (SD: 1.9) were evaluated at the age 6.7 years (range 6.3-7.4 years). Serum Cystatin C, microalbuminuria, renal ultrasound and 24-hour ambulatory blood pressure measurements were performed.

Results: Mean serum Cystatin C level was 0.63 mg/l (range: 0.45-0.78 mg/l) and mean estimated GFR was 124 ml/min/1.73m² (range: 98-176). Renal problems were found in 9/40 (22.5%) children including: mild hypertension (n=5), microalbuminuria (>20mg/g of creatinine) (n=3) and low renal volume on ultrasound (n=5).

Conclusions: The prevalence of renal problems in 7 year old children born as ELBW infants is considerable, although Cystatin C levels in all assessed children were within normal range. Obtained eGFR values may suggest compensatory hyperfiltration of kidneys, which might result in increased frequency of renal complications at later age. So, it is important to include systematic renal evaluation in the follow-up programs of ELBW infants.

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HEALTH AND SCHOOL PERFORMANCE: LONGITUDINAL FINDINGS FROM PROJECT HEALTHY PATHWAYS

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Background/aim: Although the connections between health and school performance are well accepted, data on the specific mechanisms that account for this relationship is remarkably scant. The aim of this study was to characterize the longitudinal associations between child health and academic achievement among 4th-8th graders followed for 3 years in 3 school districts in the USA.

Design/Methods: Project Healthy Pathways, an NIH-funded study, enrolled 2,091 4th-6th grade students (90% with complete data) and used a cohort sequential design to monitor changes over 3 years in their health, as reported by children (ACASI) and parents (mailed questionnaires), and their performance on standardized achievement tests and annual grade point averages.

Results: Both the quantity and pattern of children's health significantly predicted achievement test scores and grade point average. Although health declined for many children during entry into adolescence, about 20% experienced large decrements in health. These children were more likely girls, had low self worth, and experienced early puberty. Significant positive predictors of school performance were good nutrition habits, good coping, adequate levels of sleep, and feeling connected with adults, and negative predictors included feelings of stress,