

countries despite improvements in mortality rates. In the UK, the deprivation gap is widening in spite of attempts to address it. We aimed to investigate time trends in socioeconomic inequalities in cause-specific neonatal mortality in England 1997-2007.

**Methods:** Information about all live births and neonatal deaths (18524 deaths) of singleton infants were obtained. Deprivation was measured using the UK Government Index of Multiple Deprivation. Socioeconomic inequalities in cause-specific neonatal mortality rates over time were estimated using Poisson regression models.

**Results:** The all-cause mortality rate ratio between the most deprived decile and the least deprived decile increased from 2.08 in 1997-1999 to 2.68 in 2003-2005 before a slight fall to 2.35 in 2006-2007. Mortality due to immaturity (< 24 weeks gestation) did not decrease over time and had the widest deprivation gap. Mortality rates for all other causes fell over time. The deprivation gap widened between 1997-1999 and 2003-2005 before a slight fall in 2006-2007 for congenital anomalies; immaturity; and accidents and other specific causes. In contrast mortality rates fell slightly more among the more deprived quintile for intra-partum events and sudden infant deaths leading to a narrowing of the deprivation gap but they comprised only 16.8% of deaths.

**Conclusions:** 80% of the deprivation gap in all-cause mortality was explained by immaturity and congenital anomalies. Understanding the link between deprivation and preterm birth should be a major research priority so interventions to reduce preterm birth can be identified.

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#### CLINICAL ASPECTS OF PNEUMONIA WITH TACHYPNEA IN PEDIATRIC PATIENTS WITH H1N1 INFLUENZA

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**Purpose:** We evaluate the clinical and laboratory characteristics, and progress of pediatric patients hospitalized for pneumonia and laboratory-confirmed H1N1 influenza infection.

**Methods:** From September through December, 2009, a total of 101 patients were enrolled. They

were divided into group 1 with fast respiration rate for age (n=66), and group 2 with appropriate respiration rate for age (n=35). We reviewed retrospective medical chart to collect data on the hospitalized patients.

**Results:** Group 1 was significantly older than group 2 (median age 7 years vs. 4years,  $P < 0.001$ ), and 57% were between 6 and 8 years of age. Sixteen (24%) of the group 1 had underlying medical conditions, most of all had asthma; the other 50 were previously healthy. Oxygen saturation on admission day was significantly lower in group 1 than in group 2 (92% v. 98%,  $P < 0.001$ ) and 46 (70%) of the group 1 had hypoxia (oxygen saturation 92%). The frequency of lymphopenia was significantly higher in group 1 than in group 2 (n=59 v. 11,  $P < 0.001$ ). Some of group 1 received systemic corticosteroid therapy, intravenous immunoglobulin infusion, and oxygen supplement (respectively, n=28, 16, 48). The frequency of systemic corticosteroid therapy and oxygen supplement was higher in group 1 than in group 2 (respectively,  $P < 0.001$ ).

**Conclusions:** H1N1 influenza infection complicated with pneumonia can cause severe illness in previously healthy children without risk factors. Multi-center study is needed to evaluate clinical and epidemiologic characteristics in pediatric patients with 2009 H1N1 influenza.

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#### GLOMERULAR HYPERFILTRATION INJURY IN CHILDREN WITH A SOLITARY FUNCTIONING KIDNEY: A PREDICTION MODEL - THE KIMONO-STUDY

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**Objective of study:** Renal mass reduction leads to glomerular hyperfiltration injury and is associated with hypertension, (micro-)albuminuria and glomerulosclerosis in animal studies. By definition, renal mass reduction exists in children with a solitary functioning kidney (SFK) and as such they are eligible for the study of glomerular hyperfiltration in humans.

**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.