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## Drugs as Risk Factors of Acute Renal Failure

### Abstract

**Background and objectives:** Acute renal failure (ARF) is a serious condition in critically ill children. Nephrotoxic medication exposure is likely a common contributing factor to ARF, but little literature is available in paediatrics. The primary aim of the study was to assess a potential association between drugs and the risk of developing ARF in critically ill children with no pre-existing renal insufficiency.

**Methods:** We performed a retrospective case-control study in an interdisciplinary paediatric intensive care unit (PICU). Cases were patients who developed ARF during PICU stay, defined as serum creatinine more than two times the upper limit of normal range for age. PICU-patients without ARF served as controls and were matched to cases on age category and gender in a one to one ratio.

**Results:** 103 case-control pairs (total 206 patients) were included in the analysis. Cases were not statistically different from controls with regard to median weight and main diagnoses, but differed with regard to the need of mechanical ventilation (77% vs 52%), the severity of illness and the median length of PICU stay. Fifty-nine percent of the cases were exposed to one or more drugs, whereas only 14% of the controls were exposed to drugs before the index date. Cases received a median of three (range 0-30) different drugs. Multivariate models revealed a statistically significantly higher risk of developing ARF for patients treated with Cefazolin (OR 3.95; CI 95% 1.85 to > 999), Metamizol (OR 2.87; CI 95% 1.25 to 248.3), Morphin (OR 3.24; CI 95% 3.76 to 174.9) or Paracetamol (OR 3.26; CI 95% 3.62 to 187.9). A similar association could be shown for some specific medication groups such as betalactam antibiotics, drugs for cardiac stimulation, diuretics, glucocorticoids, and non-steroidal anti-inflammatory drugs.

**Conclusion:** The results of this small case-control study suggest that drugs are associated with acute renal dysfunction in critically ill children, but the multifactorial causes of ARF should be kept clearly in mind. Early recognition of drug induced renal dysfunction may alleviate some of the mortality in the PICU.