

RISK FACTORS ASSOCIATED WITH KIDNEY IMPAIRMENT IN DEHYDRATED CHILDREN

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Background and Aim: Dehydration-related kidney impairment is often underestimated. The study aimed to evaluate the risk factors for its development in dehydrated pediatric patients.

Materials and Methods: Children aged 1–17 years requiring intravenous rehydration for dehydration were prospectively enrolled and stratified by kidney function: Group A – eGFR < 90 mL/min/1.73 m², Group B – normal function. Exclusion criteria were chronic kidney disease, oncohematological disorders, and diabetes mellitus. A standardised anamnesis included age, birth weight, gestational age, pre-admission duration of dehydration-inducing symptoms, ibuprofen and paracetamol use and dose (mg/kg), chronic diseases, long-term medication use. Laboratory variables included blood pH, serum bicarbonate, potassium, sodium, haemoglobin, and hematocrit.

Results: 179 children were included (Group A: n=90, 49 males; Group B: n=89, 47 males) with median ages of 8.57 ± 4.5 and 8.09 ± 4.5 years. Acute kidney injury (KDIGO serum creatinine criteria, stages I-II) occurred in 36 (40%) Group A patients. Groups did not significantly differ in chronic diseases, long-term medication use, gestational age, birth weight, or laboratory parameters. Pre-admission ibuprofen and paracetamol use was more frequent in Group A (65.6% vs 47.2% and 52.2% vs 31.5%) and was associated with kidney impairment ($p = 0.013$ and $p = 0.005$), although combined versus single-drug use did not differ. Total ibuprofen dose was not predictive (AUC = 0.503), whereas paracetamol at 37.0 mg/kg showed borderline discrimination (AUC = 0.623, $p = 0.059$, sensitivity 47.8%, specificity 78.6%). Symptom duration was longer in Group A (58.0 vs 39.3 hours, $p = 0.020$) and showed modest predictive value at a cutoff of 38.5 hours (AUC = 0.655, 95% CI 0.575–0.734, $p < 0.001$). No correlation was found between age and symptom duration ($p = 0.424$).

Conclusions: A paracetamol dose of 37.0 mg/kg and symptom duration of ≥ 38.5 hours are predictive factors for kidney impairment in dehydrated children.

Keywords: children, dehydration, kidney impairment, risk factors