Nephrotoxicity in Children Receiving Chemotherapy - ‘Omics and Biomarkers

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Background/Objectives: Nephrotoxicity is a common adverse side effect in children receiving treatment for cancer, and with drugs such as cisplatin, ifosfamide and high dose methotrexate, can be a significant and dose limiting toxicity. No novel markers of renal injury other than measure GFR have found routine use in clinical practice and clinical trials.

Design/Methods: Here we described work exploring historical and contemporary markers of renal injury within this group, including a systematic review of markers of tubular damage, epidemiology of serum and biochemical changes and a consideration of clinical markers including magnesium supplementation. Further research considers a recently completed metabolomic analysis of paired urine and serum samples from paediatric patients receiving ifosfamide, and pharmacogenomics of cisplatin induced renal injury.

Results: Changes with serum and urinary markers of renal injury are well established, but few have been validated in clinical trials or through longitudinal research. Animal models however have demonstrated that several markers demonstrate clear clinical utility and prognostic value. An ongoing controversy remains the reversibility of kidney injury and factors that confer increased risk, such as concurrent nephrotoxic agents.

Conclusion: Both renal and serum markers of acute kidney injury should be included in future randomised clinical trials to determine their clinical utility and value as both in both the diagnosis of acute kidney and prognostic value in predicting long term outcomes.