Pediatr Blood Cancer. 2024 Nov 6:e31404. doi: 10.1002/pbc.31404. Online ahead of print.

Long-term renal outcomes of children with cancers treated with platinum-based chemotherapy: A retrospective chart analysis

Adrian Kan [1], Sarah Marokakis [1], James H Ward [1 2], Siah Kim [1 2 3], Melissa Gabriel [1], Anne M Durkan [1 2 3]

Affiliations

PMID: 39503057 DOI: 10.1002/pbc.31404

Abstract

Purpose: Platinum-based chemotherapy is a mainstay of treatment for many childhood cancers but is associated with acute nephrotoxicity and long-term ototoxicity. There is emerging evidence of long-term renal complications. This study aimed to assess the prevalence of chronic kidney disease (CKD) in children treated with platinum chemotherapy (cisplatin and carboplatin) and identify potential risk factors for the development of CKD.

Methods: We conducted a retrospective review of children diagnosed with hepatoblastoma, osteosarcoma, neuroblastoma, or medulloblastoma who received platinum chemotherapy over a 16 year timeframe. Patients were excluded if they did not have at least 3 years follow up data, died within 3 years of platinum chemotherapy, or if they relapsed. Clinical data were collected at baseline (first dose), 1 year, and at most recent follow up.

Results: Of 328 treated patients, 147 met the inclusion criteria and were followed for a mean of 8.1 years (range 3-15.7 years). The median age at first dose was 3.7 years (IQR 1.7-9.6 years). CKD ≥grade 2 was present in 53(36%) at last follow up and 15(10%) had tubular dysfunction. A history of acute kidney injury at any time during treatment was associated with CKD (OR 3.12 CI 1.07-9.12, p =0.04). On multivariable analysis older age at platinum therapy (OR 1.2, CI 1.1-1.4, p = 0.004) and a high aminoglycoside or vancomycin trough level (OR 4.3, CI 1.9-9.7, p < 0.001) were risk factors for CKD.

Conclusion: The high rate of CKD in children treated with platinum chemotherapy warrants long-term follow-up and screening for progressive disease.

Keywords: chronic kidney disease; nephrotoxicity; oncology; pediatric; platinum-based chemotherapy.