Sodium thiosulfate during cisplatin-based hyperthermic intraperitoneal chemotherapy is associated with transient hypernatraemia without clinical sequelae

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Abstract: Cisplatin is commonly used during intraperitoneal chemotherapy however has well-established nephrotoxic side-effects. Sodium thiosulfate is often added to cisplatin-based hyperthermic intraperitoneal chemotherapy (HIPEC) protocols to mitigate this, however evidence regarding risk of hypernatraemia is scarce as of yet.

Methods

We retrospectively identified patients undergoing cytoreductive surgery (CRS) for peritoneal surface malignancies of any origin at a single high-volume unit between April 2018 and December 2020. Patients were included if they received cisplatin-based HIPEC with intravenous sodium thiosulfate. Blood tests were collected pre-surgery and then daily during admission. Hypernatraemia was defined as serum sodium >145 mmol/L. Renal impairment was defined using the RIFLE criteria.

Results

Eleven CRSs met inclusion criteria, the majority of which were indicated for ovarian cancer (72.7%). One (9.1%) patient with mesothelioma received mitomycin C as an additional chemotherapy agent. The incidence of hypernatraemia was 100% but all cases were transient, with no clinical sequelae observed. The rate of AKI was 36.4%, with three (27.3%) patients classified as risk and one (9.1%) instance of failure. No long-term renal impairment was observed.

Conclusions

Despite biochemical evidence of mild hypernatraemia but with the absence of clinical sequelae, sodium thiosulfate appears to be safe when used in adjunct to cisplatin-based HIPEC during CRS. These findings should be evaluated with further comparative studies. When describing renal impairment, it is important that standardisation in reporting occurs, with the RIFLE and Acute Kidney Injury Network criteria now the preferred consensus definitions.

Keywords: acute kidney injury, cisplatin, cytoreductive surgery, hypernatraemia, hyperthermic intraperitoneal chemotherapy, sodium thiosulfate