

## The Authors' Reply

We would like to thank Dr Salem and colleagues for their letter referring to our review article.<sup>[1]</sup> Due to a limitation on the length of our article, we focused on the more commonly encountered drug-induced electrolyte abnormalities.

As Dr Salem and colleagues point out, drugs such as penicillins and aminoglycosides have been reported to cause hypokalaemia in various studies. In a series of 16 patients treated with ticarcillin, the risk of hypokalaemia appeared greatest among patients who received higher doses (>18 g/day) of ticarcillin.<sup>[2]</sup> This risk of hypokalaemia appears lower with ureidopenicillins, such as piperacillins.<sup>[3]</sup> A Bartter-like syndrome has been reported to be associated with the use of gentamicin<sup>[4,5]</sup> as well as capreomycin.<sup>[6,7]</sup> It is not clear whether the use of NSAIDs is beneficial in this setting. In one of the cases, the electrolyte abnormality was not improved after indometacin treatment, although it was partially corrected by large doses of spironolactone.<sup>[5]</sup> In a more recent case, as a result of gentamicin administration in which renal biopsy showed evidence of hypercellularity of the renin-producing cells of the juxtaglomerular apparatus, hypokalaemia resolved after potassium and magnesium supplements and diclofenac.<sup>[4]</sup>

Hypokalaemic metabolic alkalosis with hypomagnesaemia and hypocalciuria resembling Gitelman's syndrome has also been associated with the use of cisplatin, with 14 cases reported so far.<sup>[7]</sup> The mechanism for cisplatin nephrotoxicity is not entirely clear, although it is thought that it may involve injury to the thiazide-sensitive NaCl cotransporter and distal convoluted tubule epithelial apoptosis, which may result in salt wasting and stimulation of the renin-angiotensin-aldosterone system, with consequent hypokalaemic metabolic alkalosis.<sup>[7]</sup>

Antifungals, such as amphotericin B and itraconazole, are associated with hypokalaemia and regular monitoring of electrolytes and renal function is required.<sup>[8]</sup> Recent studies suggest that amphotericin B-related hypokalaemia can be prevented with the concomitant use of amiloride<sup>[9]</sup> or spironolactone.<sup>[10]</sup> Another recently recognised cause of drug-induced hypokalaemia is aristolochic acid-induced Fanconi's syndrome with hypokalaemia.<sup>[11,12]</sup> Given the increasing use of traditional Chinese medicine, clinicians should be alerted to the possibility of hypokalaemia caused by Chinese herbs containing aristolochic acid.

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## Acknowledgements

The authors have no conflicts of interest that are directly relevant to the content of this letter.

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