An Unusual AKI

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Abstract

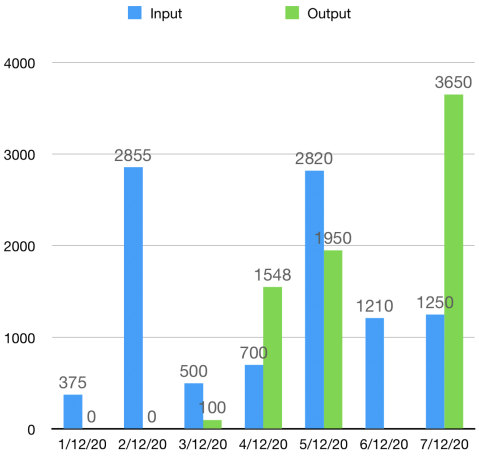
Acute Kidney Injury is one of the most commonest reasons for hospital admission and are often a side effect of prescribed medications. Acetazolamide is a medication prescribed occasionally for various indications including idiopathic intracranial hypertension, glaucoma, prophylaxis of mountain sickness and ventilator alkalosis. Although it is a medication we prescribe relatively often it is not a benign drug and it includes adverse effects of allergic reactions, acidosis, electrolyte derangement. It is a sulphonamide and like other drugs of this class it can cause impaired renal function by a variety of mechanisms including interstitial nephritis, tubular necrosis and crystalluria.

Introduction

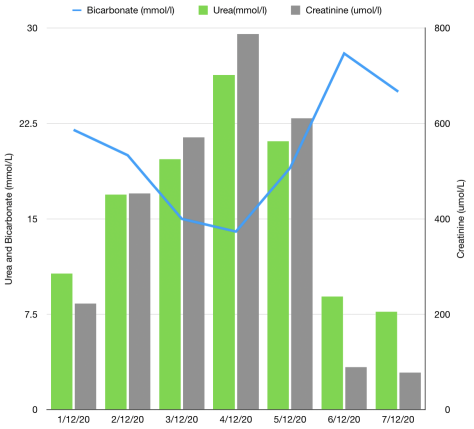
Case

A 72 year old lady attended the emergency department complaining of right sided loin pain for the preceding 36 hours. She had a medical history of hyperparathyroidism, hypothyroidism and a rectocele repaired 6 years ago. Forty-eight hours prior to her attendance she had repair of a macular hole and following this had been prescribed acetazolamide 250mg twice daily. She had taken 5 doses of this before discontinuing the medication due to nausea, vomiting and loin pain. She then attended A&E. Blood tests on presentation demonstrated reduced renal function with a creatinine of 222umol/L from a baseline of around 70umol/L. Initially she was assessed with a non-contrast CTKUB. This did not demonstrate any nephrolithiasis but did suggest some fullness of the collecting system. Given the CT findings she was further imaged with a renal tract ultrasound which excluded any hydronephrosis.

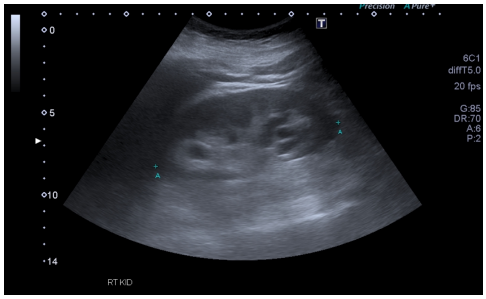
Unfortunately her renal function continued to decline and a central line was placed, 4 days following admission she was dialysed. Her renal function



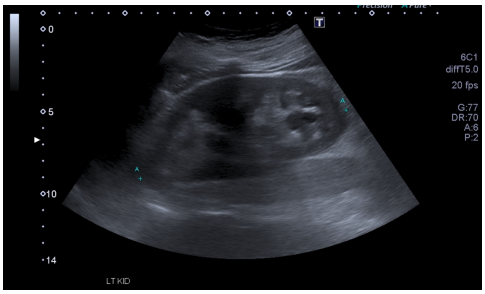
(a) Graph of Daily Fluid Balance



(b) Graph of Daily Biochemistry



(a) Ultrasound of right kidney

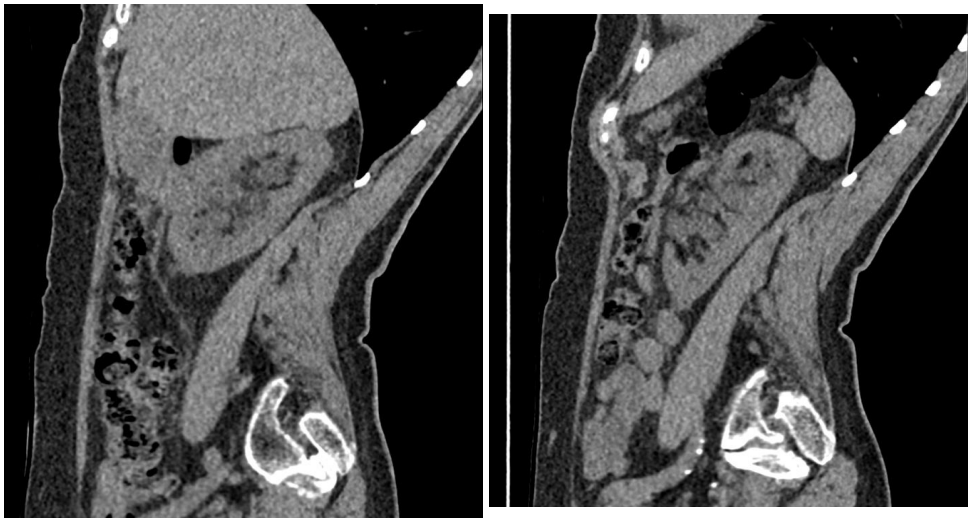


(b) Ultrasound of left kidney

then made a very rapid recovery and she entered a polyuric phase.

Discussion

A brief review of the literature demonstrated that similar presentations of acute kidney injury have previously been encountered in assocation with acetazolamide[1, 2, 3]. In each of these cases acetazolamide has been associated with renal colic and anuria. Lawson found that the AKI resolved with aggressive fluid therapy and Neyra's patient required 2 sessions of haemodialysis. Acetazolamide is recognised to be associated with metabolic drug-induced calcium phophate or oxalate calculi, however in this case these were excluded by CT imaging. An older case published by Rossert in 1989 describes a similar case in which a biopsy was performed and demonstrated



(a) CT of right kidney

(b) CT of left kidney

Tamm-Horsfall protein within the glomeruli and tubular lesions associated with intratubular crystal formation.This suggests intratubular obstruction and retrograde flow of tubular urine[2].

Conclusion

When prescribing medications it is important to consider the harms that these medications may cause. Here we describe an unusual but life-threatening side effect of acetazolamide.

References

[1] JA Neyra, JC Alvarez-Maza, and JE Novak. "Anuric Acute Kidney Injury Induced by Acute Mountain Sickness Prophylaxis With Acetazolamide." In: *J Investig Med High Impact Case Rep* 2.2 (2014), p. 2324709614530559.

[2] J Rossert et al. "Tamm-Horsfall protein accumulation in glomeruli during acetazolamide-induced acute renal failure." In: *Am J Nephrol* 9.1 (1989), pp. 56–57.

[3] C Lawson et al. “Hemorrhagic Anuria With Acute Kidney Injury After a Single Dose of Acetazolamide: A Case Study of a Rare Side Effect.” In: *Cureus* 12.8 (2020), e10107. DOI: 10.7759/cureus.10107.