Poster

[P25-1] P25-1: Anti-infective drugs (1): Aminoglycosides and beta-lactams

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[P25-1-3] Tobramycin toxicity after use of antibiotic loaded cement

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Background

This case report documents the adverse effects of tobramycin in a 73 year old elderly female patient who underwent a Prostalac (**Prost**hesis of **A**ntibiotic **L**oaded **A**crylic **C**ement) procedure due to an acute infection post total knee arthroplasty. Prostalac is a prosthesis designed for implantation into an infected joint. Medical grade cement is mixed with antibiotics and allowed to harden in a formed shape that fits into the joint. In this case, the bone cement was impregnated with both tobramycin and vancomycin. Tobramycin, an aminoglycoside antibiotic used clinically since 1972, is a bacterialcidal agent that acts by inhibiting the synthesis of protein in gram negative bacterial cells. It is eliminated in the urine as parent drug by glomerular filtration. Nephrotoxicity and ototoxicity are serious adverse effects associated with tobramycin.

Methods

Tobramycin and creatinine analyses were performed on a Beckman Coulter DxC 800 analyzer (Brea, CA, USA) using a particle-enhanced turbidimetric inhibition immunoassay (PETINIA) for tobramycin and a Jaffe rate method for creatinine. Plasma samples were used for both analyses. An estimated glomerular filtration rate (eGFR) was calculated according to the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation.

Results

Immediately prior to the Prostalac procedure, the patient had a creatinine of 103 umol/L (normal range: 40 - 100 umol/L) and an eGFR of 47 mL/min/1.73m^2 (normal range: >59 mL/min/1.73m^2). The day following the procedure creatinine was 85 umol/L and eGFR was 59 mL/min/1.73m^2. From that point forward there was a general increase in plasma creatinine concentration with a subsequent decline in the eGFR. On post-procedure day 22 the creatinine was 576 umol/L with an eGFR of 6 mL/min/1.73m^2. On post-procedure day 3 the tobramycin concentration was 3.1 mg/L. On post-procedure day 22 the tobramycin concentration peaked at 8.0 mg/L. The patient started daily hemodialysis which was subsequently decreased to a frequency of 4 times per week.

Approximately 3 months post-procedure the patient’ s creatinine was 271 umol/L, eGFR was 14 mL/min/1.73m^2 and tobramycin was 1.5 mg/L.

Conclusions

This case adds to the literature of patients experiencing acute renal failure due to tobramycin toxicity after a procedure using antibiotic loaded bone cement.