



Intravesical Amikacin Instillation for Treatment of Resistant Urinary Tract Infections

Niamh Reidy, David Moynan, Paul Reidy, Sam McConkey, Cora McNally, Eoghan de Barra
Beaumont Hospital, Dublin



INTRODUCTION

Antimicrobial resistance leads to difficulties with management of recurrent urinary tract infections, with patients often requiring hospitalisation and intravenous antimicrobial therapy. Urinary tract infection (UTI) is the most common infectious complication following renal transplantation.

Intravesical gentamicin has previously been used safely as a treatment to reduce the burden of recurrent urinary tract infections, however little is known about the effectiveness or safety of intravesical amikacin as a similar therapy. To our knowledge, it has rarely been described in the setting of renal transplantation. We describe a new protocol for management of recurrent multi-drug resistant urinary tract infections with intravesical amikacin instillations.

CASE REPORT

This female patient has a background history of end-stage renal disease due to reflux nephropathy, with cadaveric renal transplant in 2015. She has experienced recurrent multi-resistant urinary tract infections since 2017, requiring multiple hospital admission for intravenous antimicrobials. Extensive urological work-up was carried out revealing no clear reversible cause, and immunosuppression was optimised.

Prophylactic antimicrobials including cephalexin and ciprofloxacin were prescribed without success. A 3 month course of intravesical gentamicin was trialled, again with no therapeutic success. As most urinary isolates were resistant to gentamicin but sensitive to amikacin, a treatment protocol for intravesical instillation of amikacin was designed. Amikacin 250mg was dissolved in 50ml of 0.9% normal saline.

This was instilled into the urinary bladder via self-intermittent catheterisation, initially daily for two weeks, then alternate-daily for ten weeks, followed by twice weekly for twelve weeks. Amikacin levels were checked routinely to ensure no systemic absorption of the drug, and renal function was monitored.

RESULTS

There were no adverse events relating to the administration of intravesical amikacin in this patient. There were no sequelae of colonisation with multi-resistant organisms and no emergence of urinary isolate resistance to amikacin.

Frequency of symptomatic urinary tract infections decreased from weekly to less than monthly, while severity and duration of lower urinary tract symptoms also subjectively significantly improved in this patient. Renal transplant graft function remained stable throughout treatment with intravesical aminoglycoside.

CONCLUSIONS

Intravesical amikacin was moderately successful in improving quality of life and reducing burden of symptomatic urinary tract infections, and provides an option for treatment in cases with gentamicin resistance. Blood amikacin levels were undetectable throughout the course of treatment, reflecting a lack of systemic absorption of the drug.

Intravesical amikacin instillation is a safe, well-tolerated treatment for recurrent multi-resistant urinary tract infections, with no deleterious effects in this patient with previous renal transplant. This case demonstrates the difficulty of treating relapsing resistant urinary infections in renal transplant patients.

REFERENCES

1. Kuipers S, Ruth MM, Mientjes M, de Sévaux RGL, van Ingen J. A Dutch Case Report of Successful Treatment of Chronic Relapsing Urinary Tract Infection with Bacteriophages in a Renal Transplant Patient. *Antimicrob Agents Chemother.* 2019 20;64(1).
2. Salehipour M, Salehi H, Fathikalajahi A, Mohammadian R, Emadmarvasti V, Bahador A, et al. Is perioperative intravesically applied antibiotic solution effective in the prophylaxis of urinary tract infections after renal transplantation? *Urol Int.* 2010;85(1):66–9.
3. Cortés González JR, Ortiz Lara GE, Arratia Maqueo JA, Gómez Guerra LS. [Continuous bladder irrigation with amikacin as adjuvant treatment for emphysematous cystitis]. *Arch Esp Urol.* 2007 Dec;60(10):1.218-211.220.