Role of gentamicin in reducing urinary tract infections in patients with neurogenic bladder

Michael S. Floyd Jr, MCh, FRCS (Urol), Rauf N. Khadr, MD
Northwest Regional Spinal Cord Injury Unit, Southport & Ormskirk NHS Foundation Trust, Merseyside, United Kingdom

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We read with interest the recent study by Cox et al in the September 2017 issue of *CUAJ*.[1] Authors describe a series of 20 neurogenic bladder patients on intermittent self-catheterization treated with intravesical instillations of gentamicin in order to reduce recurrent urinary tract infection (UTI). The authors state that use of intravesical gentamicin reduced the frequency of UTI from four episodes in six months to one in six months. Additionally, less telephone encounters and fewer hospital visits were recorded and other antibiotic usage decreased, with minimal adverse events noted. A secondary aim was to assess microbiological resistance patterns: the rate of overall resistance to gentamicin did not increase.

Of the 20 patients involved, 59.1% were male, and spinal cord injury (SCI) accounted for 63.6% of those included, with 13.6% of patients having multiple sclerosis (MS). The mean age of participants was 37.5 years.

The authors emphasize the reduction in hospitalizations, emergency room visits, and telephone encounters as a result of this novel treatment. Specific to the SCI and MS patients, this is a very important point, as bladder function frequently affects quality of life.[2] It should be acknowledged by the authors that no validated questionnaire specific to the neurogenic bladder patient was included to assess the quality of life improvement with respect to bladder health after intravesical gentamicin treatment. In our neuro-urology unit, we routinely use the SF Qualiveen questionnaire [3] at baseline assessment of all SCI and MS patients in order to determine the impact of bladder symptoms on quality of life pre and post any bladder-specific treatment. One of the domains tested is “frequency of limitations” and enquires about life being regulated by bladder problems: if intravesical gentamicin reduces hospital visits and UTI, then overall quality of life due to bladder health is presumably better in the neurogenic patient and should be measured objectively.

Additionally, although data pertaining to intravesical gentamicin use is limited in cases of recurrent UTI, case reports exist in the U.K. literature. Naderi et al have reported successful treatment of recalcitrant *E. coli* UTI in an 81-year-old diabetic female with multiple allergies following a five-day course of daily intravesical gentamicin.[4]

Finally, although no significant adverse effects were reported, the authors do not address the hypothetical risk of systemic absorption. Whatley et al have reported on the

proposed risk of systemic absorption in ENT patients undergoing nasal irrigations with gentamicin.[5]

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Author reply

Anne P. Cameron, MD, FRCSC, FPMRS
Department of Urology, University of Michigan, Ann Arbor, MI, United States

In response to the above letter to the editor, we do agree that a validated quality of life questionnaire would significantly have enhanced these findings since we only have anecdotal evidence of the improved quality of life with the reduction in urinary tract infections (UTIs). As a result of this lack of objective data, in our future prospective work, we plan to employ the UTI-specific questionnaire authored by Tulsky et al[1] that measures quality of life in spinal cord injury and also has a specific bladder complications scale.

Gentamicin absorption has been studied in animal and human work at our institution.[2] Ten children, many with augmentation cystoplasties or vesicoureteric reflux, which potentially could have increased absorption over a native bladder, had serum gentamicin levels drawn 30 minutes after instillation and none had measurable levels or changes in creatinine during the study. Similar findings were seen in the six study dogs. This study was the basis for ongoing use of this method of prophylaxis at our site. Another study also addressed safety in 80 children receiving chronic gentamicin bladder instillations where half had a prior augmentation cystoplasty. All patients had serum gentamicin levels drawn and none had measurable values.[3] Given these negative studies in high-risk populations and the known lack of absorption of gentamicin from the gut and bladder, we do feel that this is a safe therapy with no reported systemic absorption in a human receiving the drug via the bladder.

References

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