Title: Complicated UTIs with diabetes mellitus

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Abstract

Diabetes mellitus in uncontrolled condition sometimes deteriorates lower urinary tract function and host immune system. Patients with diabetes mellitus more frequently have a severer bacterial urinary tract infection (UTI) compared to those without diabetes mellitus, especially when they are treated by oral medication or insulin. They have five to ten-fold higher risks of acute pyelonephritis and UTIs in patients with diabetes mellitus are difficult to treat and has higher risk of recurrence. Bacteriuria is also more common in female patients with diabetes mellitus than those without diabetes mellitus.

The empiric antimicrobial therapy for diabetic patients with complicated UTIs is similar to that of patients with uncomplicated UTI because the causative pathogens are usually the same. Enteric gram-negative bacilli, such as E. coli, Klebsiella sp, Proteus sp and Enterobacter are usual bacterial causes and in severe condition, Pseudomonas aeruginosa and Enterococcus faecalis may be considered as possible causes. Severe conditions of UTIs such as emphysematous cystitis, emphysematous pyelonephritis and papillary necrosis predominant in patients with diabetes mellitus especially in uncontrolled condition. When these conditions were suspected, imaging examination such as computed tomography (CT) should be performed to confirm the diagnosis, and invasive intervention such as ureteral drainage or surgical nephrectomy should be considered in addition to adequate antimicrobial therapy. Asymptomatic bacteriuria is also common to those with diabetes mellitus and antimicrobial treatments is not recommended in nonpregnant women of any ages.

Sodium-glucose transport proteins (SGLT2) inhibitors, an anti-diabetic medicine blocks the reabsorption of filtered glucose, leading to glucosuria and improvements in glycemic control. Glucosuria may encourage bacteria in the urinary tract and increase the UTI events. Recent meta-analysis of randomized controlled trials revealed SGLT2 inhibitors are associated with an increased risk of genital tract infections and there is no association overall between GLT2 inhibitors and UTI and pyelonephritis.