



Know Your Antibiotic: Trimethoprim-Sulfamethoxazole & Acute Kidney Injury

Introduced to the US market in the early 1970's, trimethoprim/sulfamethoxazole (TMP/SMX) is an antimicrobial with broad usage in bacterial, fungal, and parasitic infections.¹ With an oral bioavailability of near 100%, it is a preferred oral step-down option in uncomplicated gram-negative bacteremia, however antibiotic selection should take into consideration host factors and risk for TMP/SMX toxicities. One common concern with using TMP/SMX is acute kidney injury (AKI).² Read on to learn more about the characteristics of TMP/SMX associated AKI.

How often does AKI occur with TMP/SMX?

Acute kidney injury rates with TMP/SMX vary depending on the dose. Reported rates range from 5% to up to 13% in higher doses.³

Are elevations in serum creatinine always a TMP/SMX associated AKI?

No. Relying solely on a rise in serum creatinine (SCr) to detect AKI due to TMP/SMX will overcall rates of AKI. This is because small increases in SCr are expected with TMP/SMX use. TMP/SMX inhibits tubular secretion of SCr *without affecting glomerular filtration*.⁴ Benign SCr rises of up to 30% have been reported with TMP/SMX. Increases in blood urea nitrogen (BUN) in addition to SCr may improve the specificity for detecting true AKI associated with TMP/SMX.⁵

When does TMP/SMX associated AKI occur and how bad does it get?

In one study of hospitalized middle-aged veterans that received ≥ 6 days of TMP/SMX, the onset of AKI varied and started as early as two days after starting therapy and up to two days after discontinuation of TMP/SMX. The median time to detection of AKI was 6.5 days. When comparing those who received TMP/SMX and developed AKI versus those who did not develop AKI, the post treatment serum creatinine levels were 2.1 ± 0.8 and 1.1 ± 0.5 mg/dL, respectively.⁵

Is TMP/SMX associated AKI reversible?

In the study with veterans, renal function returned to normal within 1 month after discontinuing TMP/SMX for 93% of patients. Mean time to return to baseline was 9.1 ± 9.4 days.⁵

Key Take-away: Elevations in SCr with TMP/SMX do not always represent true kidney injury. Monitoring BUN in addition to SCr may help identify true AKI. TMP/SMX associated AKI is usually transient and resolves upon discontinuation.

Reference:

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