Evaluation of Single Dose Ceftriaxone Treatment of Urinary Tract Infections

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Background: Urinary tract infections (UTI) are diagnosed in over one million emergency department (ED) visits each year in the United States. Optimal management of UTIs in the ED setting is particularly challenging due to the lack of microbiologic data and decreased continuity of care. Patients are often treated empirically with parenteral ceftriaxone and subsequently discharged home with oral (PO) antibiotics. However, some studies have shown that a single dose of intramuscular (IM) ceftriaxone is as effective as a prolonged course of oral antibiotics.

Objective: The purpose of this study is to compare the rate of ED intervention after a single dose intravenous (IV) ceftriaxone monotherapy compared to IV ceftriaxone plus discharge antibiotics for the treatment of UTIs.

Methods: Patients who received a single dose of IV ceftriaxone for the empiric treatment of a UTI from July 1, 2015 to July 1, 2017 were retrospectively identified. Inclusion criteria were patients at least 18 years of age, had a positive urinalysis and reflex urine culture, and were prescribed and administered a single dose of IV ceftriaxone. Patients were excluded if they were a prisoner, pregnant, received more than one dose of ceftriaxone, received additional antibiotics while in the ED, or had a hospital admission associated with the index ED visit. The primary outcome was the number of patients requiring additional follow up in each treatment group. Additional follow up was defined as presentation back to the emergency department and/or the prescription of additional antibiotics by the advanced practice provider or external provider within two weeks. Secondary outcomes included classification of UTI, organism species, quantity of bacteria, and susceptibility results of the organism.

Results: The study included 83 patients, 43 of which were treated with a single dose of IV ceftriaxone. The number of patients who were treated with ceftriaxone monotherapy that returned to the ED for a urinary complaint was not statistically different compared to those treated with ceftriaxone plus discharge antibiotics (7% vs 7.5%; p-value= 0.98). Additionally, there was no significant difference between groups in the number of patients requiring additional antibiotic prescriptions by either the advanced practice provider or an external provider. Of the patients treated with ceftriaxone monotherapy, 58.1% had cultures that resulted in no bacteria quantity, with urogenital flora being most common type of organism (48.8%). Forty-five percent of cultures from the ceftriaxone plus discharge antibiotics group had bacteria quantities ≥ 100,000 colony forming units and Escherichia coli was the most common organism. Finally, of the cultures with susceptibility results to ceftriaxone, 88.2% of those in the ceftriaxone monotherapy group were susceptible compared to 90.9% in the ceftriaxone plus discharge antibiotics group.
Conclusion: There is no significant difference in additional prescriptions prescribed and return ED visits after treatment of UTIs with single dose ceftriaxone compared to ceftriaxone plus discharge antibiotics. However, groups may have been mismatched as shown by the difference in culture results. These results support future prospective research to further determine the efficacy of ceftriaxone monotherapy for the treatment of UTIs.