Risk factors for treatment failure among hospitalized patients with complicated urinary tract infection in countries with high prevalence of multidrug-resistant Gram-negative bacteria: a multicentre retrospective study. Results of the COMBACTE-MAGNET, RESCUING study

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Background: Urinary tract infections (UTIs) are among the most common community and hospital acquired infections. There is a need for contemporary data on management, response to treatment and outcome of patients with complicated urinary tract infection (cUTI), against a background of increasing antibiotic resistance and significant changes in patients’ characteristics. We aimed to identify significant risk factors for treatment failure, particularly those that could be modified.

Material/methods: We performed a retrospective, observational, multinational and multicenter cohort study. The study was conducted in 20 hospitals around Europe, Turkey and Israel. Approximately 50 cases of cUTI were included from each site. The study involved data collection of hospitalised patients between 01/01/2013 and 31/12/2014. Data were collected on patients with a diagnosis of cUTI as the primary cause of hospitalisation and patients who developed cUTI during their hospital stay according to adapted FDA guidance, EMA and clinical practice guidelines on cUTI’s.

The main outcome was treatment failure defined as any of the following conditions: signs or symptoms of cUTI not improved by days 5 to 7 or new cUTI related symptoms that have developed within 30 days or positive urinary culture within 30 days or death within 30 days. A multivariate analysis was performed to adjust for risk factors for an adverse outcome. Results are reported as odds ratios (OR) with 95% confidence interval (95% CI).

Results: Overall, 989 patients with cUTI were included. The median age of the cohort was 68 years (IQR 56-80). Catheter associated UTI (CaUTI) accounted for 33.4% (340/989) of infections and 20% (198/989) were diagnosed as acute pyelonephritis. Treatment failure was observed in 26.6% (261/981) of patients; 52.5% due to CaUTI, 10.7% due to pyelonephritis and 36.8% due to other UTIs. Total 30 day mortality rate was 8.7% (85/976). In univariate analysis patients that received early antibiotic treatment had a lower risk for treatment failure vs patients that received a later antibiotic treatment (days: 0.78±1.88 vs. 1.53±3.72, p=0.006). In multivariate analysis for treatment failure,
years of age (OR 1.01; 95% CI: 1.003 to 1.024), CaUTI (OR 1.5; 95% CI: 1.02-2.22), cancer (OR 1.78; 95% CI: 1.18-2.68), acquisition in intensive care unit (OR 5.45; 95% CI: 3.35-8.88), corticosteroid therapy at admission (OR 2.19; 95% CI: 1.19-4.03) and bedridden status (OR 2.13; 95% CI: 1.38-3.3) were found to be independent predictors of treatment failure.

**Conclusions:** Patients that are hospitalised and treated for cUTI according to current definitions have substantially different treatment failure rates according to source of infection. Patients with CaUTI had significantly higher treatment failure rates compared to patients with other sources of urinary infections. A higher treatment failure rate was also observed among older patients and patients with underlying diseases, but not related to management variables.