EVALUATION OF CHILDHOOD URINARY TRACT INFECTION AND ANTIBIOTIC SUSCEPTIBILITY IN A TURKISH CENTER

Introduction Urinary tract infection (UTI) is the most common bacterial infection in children under 2 years of age. Proper and timely treatment protects patients from long-term complications such as renal scarring, hypertension, and end-stage renal disease.

Methods The file records of 729 patients aged between 0–18 years, followed up with diagnosis of urinary tract infection, vesicoureteral reflux and neurogenic bladder in Ege University Pediatric Nephrology Unit between February 2013 and November 2018 were retrospectively reviewed.

Results A total of 1126 positive urine cultures of 729 patients (65% female/35% male) were included in the study. The mean infection time was 56 ± 53 months. Most of the cultures (88.2%) were gram negative. *Escherichia coli* (*E. coli*) was the most common isolated bacteria with a prevalence of 59.1% (n = 666) followed by *Klebsiella pneumonia* with 17.9% (n = 202), *Enterococcus faecalis* 8.3% (n = 93), *Proteus mirabilis* 3.2% (n = 37), *Enterococcus faecium* 2.9% (n = 33) and *Pseudomonas aeruginosa* 2.5% (n = 28). *Enterobacteriaceae* in 962 cultures (85.4%) constitute most bacteria in this study. Ampicillin, cefuroxime and trimethoprim-sulfamethoxazole with susceptibility rates of 18.6%, 39.6%, 49.0% respectively, constitute of the highest resistant antimicrobials to *Enterobacteriaceae*. Antimicrobials with the highest susceptibility in this group were meropenem, imipenem and ertapenem with susceptibility rates of 99.2%, 97.1% and 96.1% respectively. *Enterococcus spp.* showed the highest resistance to gentamycin with 50% resistance to tested cases. *Pseudomonas spp.* with 64.3% susceptibility, showed the highest resistance to piperacillin-tazobactam.

Conclusion Enteric bacteria, majority of which constituted by *E.Coli* are at the forefront in the etiology of UTI. Diagnosis and accurate treatment of the disease prevents or reduces late complications and morbidity. Determination of local antibiotic susceptibility patterns, that expected differ by region and time, has a great importance for initiating effective empirical treatment and prevent complications.

Investigation of children with urinary tract infection (UTI) or other renal disease often involve combination of dimercaptosuccinic acid (DMSA) imaging and ultrasound (US) imaging to identify structural and functional defects.

DMSA imaging provides information on the relative function of the right and left kidneys and is considered the gold-standard imaging modality for the detection of renal scarring. DMSA imaging requires an intravenous injection of a radioactive agent and often requires sedation in babies and young children. DMSA imaging takes more than two hours to complete and is not suitable for frequent repeat studies.

US imaging provides information on renal size, parenchymal appearance and structural abnormalities such as calyceal and/or renal pelvic dilatation. US imaging is non-invasive, does not involve ionising radiation and can be performed in most children without sedation or anaesthetic. US imaging takes less than 30 minutes to complete and can be repeated easily for follow up.

We have obtained ethical approval to investigate the associations between DMSA-assessed renal function discrepancy with US assessment of renal length, renal volume, renal length discrepancy and renal volume discrepancy. Image data will be captured and analysed from children who underwent both DMSA imaging and renal US imaging in our hospital between 2015 and 2018. The analytical group (n=200) has been limited to those who underwent imaging as part of investigation of UTI or other renal disease who had DMSA and ultrasound scanning within six months of each other and whose images are adequate to obtain the relevant measurements.

Finding strong associations and sufficient diagnostic accuracy may mean that the non-invasive and more easily performed US examination, which does not involve ionising radiation, may reduce the need for DMSA scanning in some children.