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Urinary tract infections in children under 12 years of age

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As there are no modern national guidelines for the treatment of urinary tract infections (UTIs) in children under 12 years of age (in Croatia there are ISKRA guidelines for the diagnosis and treatment of UTIs in persons over 12 years of age), this article aims to summarize several current international guidelines and research findings on the incidence, diagnosis, consequences and prophylaxis of UTIs (1).

Based on the widely accepted view that UTIs in the youngest age group represent a systemic infection with secondary urinary tract involvement, modern guidelines distinguish between infants under two months of age and older infants and children (2). UTIs account for 5–14 % of pediatric emergency admissions and are the cause of fever in 7 % of cases. In the first six months of life, urinary tract infections are more common in uncircumcised male infants than in female infants, but the incidence shifts in favor of female infants later in life.

The clinical presentation of urinary tract infections varies according to age. Younger children may present with crying, irritability, or feeding difficulties along with fever, while older children may present with dysuria, increased urinary frequency, and occasionally incontinence with urinary urgency. Laboratory findings should confirm leukocyturia (a urine dipstick test for leukocyte esterase is sufficient) and the presence of nitrites. Nitrites only become positive if the urine remains in the bladder for at least four hours. Urine should be delivered to the laboratory for microbiological analysis as soon as possible, ideally within four hours of collection. If access to the laboratory is delayed, the urine can be stored in the refrigerator for up to 24 hours. According to the American Academy of Pediatrics (AAP) guidelines (3), the only valid methods for urine specimen collection are one-time catheterization or suprapubic aspiration. In contrast, the Swedish Reflux Trial and NICE guidelines indicate that catheterization is unnecessary. In Croatia, urine samples are often collected using urine collection bags, where prior genital hygiene is required and the bag should not remain in the body for more than one hour. However, in the upcoming national guidelines, catheterization is likely to be recommended as the standard for collecting urine samples for microbiological analysis.

Acute pyelonephritis should be treated for 10–14 days, starting after a urine culture has been taken. If the child is in good general health and tolerates oral medication, oral therapy can be initiated; otherwise, parenteral therapy is required. There are no clear recommendations for initial therapy in children under 12 years of age, but third-generation cephalosporins are often preferred in clinical practice.

According to the NICE guidelines, urinary tract infections are classified as typical or atypical (1). Atypical UTIs include non-E. coli pathogens, persistent fever despite 48 hours of treatment, abdominal mass or tenderness, weak urine stream, elevated creatinine levels, and a severe clinical

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course. The NICE pathway "Fever in children under 5 years of age" can be used to assess the severity of a urinary tract infection (4).

All children diagnosed with pyelonephritis should have a renal ultrasound either during treatment or ideally two weeks after completion of treatment. If the child has recurrent UTIs, atypical UTIs, or abnormal ultrasound findings, contrast-enhanced urosonography of the urinary bladder (VUS), which is available in many hospitals, is recommended.

Vesicoureteral reflux (VUR) is present in one third of children who have had acute pyelonephritis. According to the RIVUR study, antibiotic prophylaxis does not prevent renal scarring if treatment of the urinary tract infection is initiated within 48 hours of the onset of symptoms, but reduces the number of infections in children with grade III or higher VUR. The results of the Swedish Reflux Trial differ from those of the RIVUR study (5, 6). Prophylaxis is generally recommended for VUR grade III or higher, and recurrent UTIs in lower grade VUR.

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