

Should guidelines for invasive uro-radiological investigations in children after a first acute pyelonephritis be risk-adjusted? A swiss multicentric study

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Urinary tract infection (UTI) represents a worldwide and frequent cause of pediatric emergency visit. Untreated or poorly investigated febrile UTI can lead to severe acute and long-term complications, such as septicemia, arterial hypertension, acute and chronic/terminal renal failure in childhood or in adulthood. High-grade vesico-ureteral reflux (VUR) constitutes a risk factor for recurrent UTI, especially in children below 3 years of age. Voiding cystourethrography (VCUG) remains the gold standard procedure to detect VUR. However, VCUG is an invasive procedure, involves radiation, carries a risk of iatrogenic UTI, and has a significant psychological impact on the child and/or his parents. Despite a notoriously low yield of high-grade VUR detection, almost all national and international pediatric guidelines still recommend performing a VCUG after a first episode of acute pyelonephritis (APN) in children younger than 3 years of age. Prospective studies defining individual risk factors (i.e. type of urinary pathogen species and renal ultrasound (US) results) that could narrow the indications of VCUG in this condition are lacking. We previously demonstrated in a retrospective pilot study that the presence of urinary Escherichia Coli (E. Coli) pathogen and a normal renal US result, allows omitting safely VCUG in this group of infants younger than 3 months after a first APN. The 2020 Pediatric Swiss Guidelines for UTI management were subsequently updated. However, studies in older children and in the three remaining following groups (group 1: children with a urinary non-E. Coli pathogen associated with a normal renal US result; group 2: children with a urinary E. Coli pathogen and an abnormal renal US result; and group 3: children with a urinary non-E. Coli pathogen and an abnormal renal US result) are still lacking. National and international medical societies eagerly wait this information to adjust their recommendations, based on strong scientific data.

This study aims to investigate if VCUG can be omitted in children aged 0 to 36 months after a first APN. To reach this aim, we will evaluate the probability of high grade VUR (III, IV, and V) in each of the three above-described groups, based on urinary pathogen species and renal US results. This is a Swiss multicentric retrospective cohort study, including Lausanne and Geneva University Hospitals, and Vaud, Fribourg, Sion and Neuchatel Regional Hospitals. We expect that the indication of invasive VCUG after a first episode of APN will be limited only to children with a non-E. Coli infection and an abnormal renal US (group 3). These study results will allow adjusting the current national and international pediatric guidelines and elaborate a new algorithm for UTI management in children younger than 3 years of age.