Acute Lobar Nephronia in Children

Urinary tract infection (UTI) is one of the most common bacterial infections in febrile children, especially in those aged 2 years or younger. The association between UTI and congenital abnormalities, like vesicoureteral reflux (VUR), may put children at high risk for acute pyelonephritis (APN) and subsequent renal scarring. Moreover, it has been believed that post-pyelonephritic renal scarring with recurrences, especially in the presence of high-grade VUR, may cause future medical problems such as hypertension and/or impaired kidney function, which has been the driving force behind the comprehensive investigation and treatment of first-episode febrile UTI in children.

Acute lobar nephronia (ALN) is a localized, non-liquefactive, severe interstitial bacterial infection of renal parenchyma, generally affecting one or more renal lobules. It is considered as at the midpoint in the spectrum of upper UTI between APN and intrarenal abscess. ALN was first described in adults by Rosenfield et al in 1979 and was subsequently reported in children by Lawson et al in 1985. Histologically, ALN discloses localized hyperemia, interstitial edema, and leukocytic infiltration. The histopathologic features of APN are similar to, but less severe than, those of ALN, whereas intrarenal abscess shows tissue necrosis and liquefaction within the infectious areas.

ALN is not a rare condition in children. It is probably an underdiagnosed disorder. However, it is important to differentiate ALN from non-ALN UTI and intrarenal abscess, not only because these conditions are pathologically different, but also because they may be managed differently. ALN has recently been diagnosed with increasing frequency in children, as a result of the advancement of noninvasive imaging modalities. The characteristic appearance of a focal mass in the kidney with ill-defined margins is the hallmark of sonographic findings of ALN. Depending on the stages of ALN, sonographic appearance includes hypoechoic, isoechoic, and hyperechoic lesions. However, the sensitivity of this sonographic characteristic for the diagnosis of ALN is low and not satisfactory. Computed tomography (CT) is considered to be the most sensitive and accurate imaging modality for the diagnosis of ALN. However, it raises costs and radiation exposure and also requires sedation in small children. In the recent report of Cheng et al, the ALN group enrolled all severe nephromegaly cases and those cases with moderate nephromegaly on sonography but experienced fever duration > 72 hours after susceptible antimicrobial treatment. They found that ALN was correlated with the positive CT results, with sensitivity up to 90% and specificity up to 86.4%. Thus, the findings of severe nephromegaly and/or a focal mass on sonography before CT scanning can be used as effective predictors for ALN.

Clinically, the differential diagnosis between APN and ALN is difficult. ALN has a prolonged clinical course, longer fever duration before and/or after treatment, longer hospital stay, and higher inflammatory markers such as C-reactive protein and white blood cell count. Although the suggestion for the duration of antibiotic treatment remains controversial, a 2–3-week course of antibiotic therapy tailored to the children with ALN has been recommended. To prevent treatment failure, Cheng et al recently proposed that a 3-week antibiotic therapy protocol should constitute the treatment of choice for children with ALN.

ALN is associated with a high incidence of renal scarring in comparison to APN. VUR is the most common urinary tract anomaly in children with a first-episode UTI. The incidence of VUR ranged from 17% to 42% in children with ALN. The rate of VUR among ALN is close to that in children with non-ALN UTI. Thus, VUR may not be a prerequisite for the development of ALN.

ALN requires a much longer antibiotics treatment and is associated with more complications; thus, clinicians should be vigilant in differentiating children with ALN from APN. In this issue of Pediatrics and Neonatology, Chen et al provide an efficient and feasible index for clinicians based on the clinical presentations and laboratory findings. They suggest that clinicians should keep a high alertness towards ALN, particularly for those with sonographic nephromegaly, initial higher C-reactive protein, nausea/vomiting, and fever for > 5 days after antimicrobial treatment.

A limitation exists in this study that might affect the final result which should be addressed. Twenty-one of the
80 APN cases (nearly 25% of the study population) had severe nephromegaly on sonography, but without further CT results. They were finally classified into the APN group simply based on their faster clinical response to antimicrobial treatment. This might lead to section bias. Finally, the authors should be congratulated for the efforts. The study may provide a simple differentiation and management for ALN in children with UTI.

Conflicts of interest

The author declares no conflicts of interest.

Ji-Nan Sheu*
School of Medicine, Chung Shan Medical University, Taichung, Taiwan

* Department of Pediatrics, Chung Shan Medical University Hospital, Taichung, Taiwan, Number 110, Section 1, Jianguo North Road, Taichung 402, Taiwan.

E-mail address: cshy098@csh.org.tw

Mar 2, 2015

References


