UTIs: what’s the best imaging study? ► Many radiographic studies are available to evaluate infants with urinary tract infections (UTIs), including ultrasound, voiding cystourethrogram (VCUG), and renal scans, but few well-designed trials have examined the effects of these techniques on management and outcome. As part of a multicenter, randomized trial of different antibiotic regimens, 309 children (age range, 1 to 24 months) who had a first febrile UTI underwent ultrasound and a renal scan within 48 hours of diagnosis, VCUG 1 month later, and a second renal scan 6 months after that. Ultrasound results were normal in 88% of children, and the identification of abnormalities, including dilated pelvis and pelvi- caliectasis, did not lead to changes in management. The initial renal scan demonstrated pyelonephritis in 61% of children. Of 302 children who underwent VCUG, 39% had vesicoureteral reflux (VCR). Of 53 children with grade III or IV VCR, 7 had an abnormal ultrasound. Renal scarring was more likely to have developed in children with VCR (16 of 109 [15%]) than in those without (10 of 166 [6%]).

Comment ► The goal of imaging studies in children with UTIs is to identify those at risk for renal parenchymal injury and to preserve renal function. In this study, ultrasound did not contribute to the management or prediction of VCR. An editorialist (the editor-in-chief of Journal Watch Pediatrics and Adolescent Medicine) states that VCUG remains the most important radiographic study for infants with UTIs. Ultrasound is probably unnecessary, particularly in infants who show no evidence of obstructive lesions of the genital urinary tract on prenatal ultrasonography.

Howard Bauchner, MD
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Stimulants for ADHD: do they lead to substance abuse? ► Widespread use of stimulant medications for children with attention-deficit/hyperactivity disorder (ADHD) has led to concerns that such therapy might produce later substance abuse. Investigators in Boston conducted a meta-analysis of 6 studies, in which 674 children, and 508 adolescents, were evaluated for substance use during adolescence or adulthood. The pooled analysis indicated an almost 2-fold reduction in risk for substance-use disorders (drug or alcohol abuse or dependence) among children treated with stimulants. For example, in one study, 42% of children with untreated ADHD developed substance-use disorders as adolescents, compared with 16% who received stimulants. The findings were more robust when analysis was restricted to the 4 studies in which both groups had similar baseline disease severity: A 3.5-fold reduction in risk was noted for the treated group. The protective effect was more modest in studies that followed children into adulthood (1.4-fold reduction) compared with those that followed patients only through adolescence (5.8-fold reduction).

Howard Bauchner, MD
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Value of ultrasound in hip dysplasia diagnosis ► All pediatricians perform physical examinations of infants’ hips to detect developmental dysplasia of the hip (DDH). Researchers in the U.K. investigated whether ultrasonography [US] added benefit and cost efficiency in the diagnosis and management of 629 infants with hip instability during the first 6 weeks of life. Infants with instability on clinical examination were randomized to future ultrasonographic examination plus clinical examination or to the traditional clinical examination alone. At 8 weeks of age, hips found to be unstable by either examination modality were splinted. Plain radiographs were taken at 12 to 14 months and at 24 months of age. One percent
A multicentre randomised controlled trial. Inclusion of US in the diagnosis and management of unstable hips reduced the rate of any type of hip treatment by one third, compared with the rate with clinical examination alone. Use of US also reduced the number of children placed in abduction splints (P=0.01) without increasing the need for surgical procedures. Five children were not walking 2 years of age, including 1 in the US group. Despite the increased cost of multiple ultrasonographic examinations, the total cost of the diagnosis and management of DDH was slightly less in the US group, but the difference was not statistically significant.

Comment: Hip US is a valuable aid in the management of children with abnormal findings on clinical hip examination. This study was carefully designed, and important variables were considered. The reduced use of abduction splints may prevent some of the adverse consequences associated with splinting.

F. Bruder Stapleton, MD
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Improving health outcomes of children with appendicitis

Children with equivocal signs of appendicitis can be diagnosed accurately with a combination of ultrasound and computerized tomography with rectal contrast (Pediatrics 2000;106:672). In 1998, investigators in Boston implemented an imaging protocol. Children with unequivocal presentations of appendicitis went directly to surgery without imaging, but children with equivocal presentations underwent ultrasound followed by CT if ultrasound was inconclusive. Prior to 1998, children who did not proceed directly to surgery were observed, and imaging studies were not performed routinely. Rates of perforation and negative appendectomy were compared before and after the protocol was in place.

Before the protocol was implemented, 44% of children (404 of 920) went directly to surgery without imaging. After it was implemented, 30% (124 of 418) went directly to surgery without imaging. Among all patients (without and with equivocal signs), rates of perforation and negative appendectomies declined significantly after implementation (from 35% to 16% and from 15% to 4%, respectively). The declines were similar when analysis was restricted to patients with equivocal signs of appendicitis. Declines occurred only among children older than 5 years.

Comment: The implementation of this imaging protocol had 2 effects: First, fewer children went directly to surgery, and more children underwent imaging. Second, specific health outcomes improved. Of note, before introduction of the protocol, perforation and negative appendectomy rates were somewhat higher at this center compared with rates reported at other centers.

Howard Bauchner, MD
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ARCHIVIST

Hemispherectomy

The idea of removing almost half of a child’s brain sounds gross and capable of generating distinct psychological barriers to its use as treatment. Nevertheless, the operation has been performed for over half a century. Some 30 to 40 years ago it fell into disrepute because of the complications (obstructive hydrocephalus, superficial haemosiderosis, and intracranial haematoma) which occurred in up to a third of patients at that time. Improved surgical technique has, however, made the operation safe. It is now considered when seizures arise from one structurally abnormal hemisphere especially when there is hemiplegia and/or visual field defect. Cognitive and behavioural problems are common in these children. Children with Rasmussen syndrome without such disabilities may be considered. A report of 33 children operated upon at Great Ormond Street Hospital between 1991 and 1997 (AM Devlin and colleagues. Brain 2003;126:556–66) has shown that hemispherectomy can give very good results.

The children varied in age from 4 months to 17 years (median 4.25 years) and were followed up for between 1 and 8 years. They were divided into three groups according to pathology; developmental (16; 10 hemimegencerephaly, 2 polymicrogyria, 2 focal cortical dysplasia, 1 diffuse cortical dysplasia, 1 microgyrinesis), acquired (11; 6 middle cerebral artery infarct, 3 after encephalitis or trauma, 1 hemiconvulsion-hemiplegia-epilepsy, 1 perinatal ischaemia) and progressive (6; 4 Rasmussen encephalitis, 2 Sturge-Weber syndrome).

Overall, 17 children were seizure free after operation and only three had their seizures reduced by less than 75%. (Almost all had had many seizures daily before surgery.) Seizures stopped in 9/11 children with acquired pathology, 3/6 with progressive pathology, and 5/16 with developmental pathology. Freedom from seizures or >75% reduction in seizures was achieved in 10/11 (acquired), 6/6 (progressive), and 14/16 (developmental). Hemiplegia remained the same in 22 children, was worse in 6, and improved in 5. There was no significant cognitive deterioration after operation and four children showed cognitive improvement. None lost language. Twelve children had behavioural difficulties before operation and these difficulties improved postoperatively in eleven.

In a specialist centre hemispherectomy may benefit carefully selected children.