

Theme: General Pediatrics

Administration of intravenous contrast for MRI evaluation of headache (*Isr Med Assoc J.2015;17:545-8*)

The aim of this study was to assess the necessity of routine contrast administration in brain magnetic resonance imaging (MRI) of pediatric outpatients referred for workup of chronic headache. A retrospective review of consecutive pediatric brain MRI examinations in 30 pediatric outpatients referred for evaluation of chronic headache was done. Independent review was performed by two certified neuroradiologists. The raters reviewed each MRI first as a non-contrast examination (without seeing the post-contrast images) and then with post-contrast images. No abnormalities were found in six patients. One patient had an indeterminate finding of a tubular cerebellar lesion requiring follow-up. In the remaining patients, the findings were subclinical and included: mucosal thickening in the paranasal sinuses, cystic changes of the pineal gland, small developmental venous anomalies, non-specific FLAIR hyperintensities, opacification of the mastoids, and telangiectasia. The subclinical cases that were missed on pre-contrast images were: one small developmental venous anomaly, one telangiectasia and one small pineal cyst, none of which hold clinical significance. Authors concluded that there seems to be little reason to medically justify routine use of intravenous contrast administration to evaluate a brain MRI of pediatric patients referred for chronic headache.

Early Azithromycin administration and prevention of severe pneumonia (*JAMA. 2015; 314:2034-44*)

Many preschool children develop recurrent, severe episodes of lower respiratory tract illness (LRTI). This randomized double-blind placebo-controlled trial, conducted across 9 US medical centers, evaluated whether early administration of azithromycin, started prior to the onset of severe symptoms, in preschool children with recurrent severe LRTIs can prevent the progression of these episodes. Participants were 607 children aged 12 through 71 months with histories of recurrent, severe LRTIs and minimal day-to-day impairment. Participants were randomly assigned to receive azithromycin (12 mg/kg/d for 5 days) or placebo started early during each predefined respiratory tract infection (RTI). The primary outcome measure was the number of RTIs not progressing to a severe LRTI. Presence of azithromycin-resistant organisms in oropharyngeal samples, along with adverse events, were among the secondary outcome measures. Azithromycin significantly reduced the risk of progression to severe LRTI relative to placebo. Induction of azithromycin-resistant organisms and adverse events were infrequently observed. It was concluded that among young children with histories of recurrent severe LRTIs, the use of azithromycin early during an apparent RTI compared with placebo reduced the likelihood of severe LRTI. More information is needed on the development of antibiotic-resistant pathogens with this strategy.

Traffic pollution and altered brain connectivity (*Neuroimage. 2016;Jan 26. pii: S1053-8119(16)00051-3*)

Exposure to urban air pollution has been associated with poorer cognitive performance. This study aimed to assess the extent of such potential effects of urban pollution on child brain maturation using general indicators of vehicle exhaust measured in the school environment and a comprehensive imaging evaluation. A group of 263 children (age 8-12 y) underwent magnetic resonance imaging (MRI) to quantify regional brain volumes, tissue composition, myelination, cortical thickness, neural tract architecture, membrane metabolites, functional connectivity in major neural networks, and activation/deactivation dynamics during a sensory task. A combined measurement of elemental carbon and NO₂ was used as a putative marker of vehicle exhaust. Air pollution exposure was associated with brain changes of a functional nature, with no evident effect on brain anatomy, structure or membrane metabolites. Specifically, a higher content of pollutants was associated with lower functional integration and segregation in key brain networks. Higher exposure was associated with slower brain maturation. In conclusion, urban air pollution appears to adversely affect brain maturation in a critical age with changes specifically concerning the functional domain.

Vitamin D deficiency and sepsis (*Paediatr Int Child Health. 2016;36:15-21*)

This study investigated the prevalence of VDD in 124 critically ill children (age 1-12 y) with sepsis admitted in a pediatric intensive care unit (PICU) and 338 controls in Northern India over a one-year period. Demographic data, clinical signs and risk factors for VDD, Paediatric Index of Mortality III (PRISM III) score, and sequential organ failure assessment (SOFA) score were recorded. Plasma 25-hydroxy vitamin D [25(OH)D] levels were measured by ELISA within 24 hours of admission. The occurrence of septic shock, multiple organ dysfunction syndrome (MODS) and healthcare-associated infection (HCAI), need for mechanical ventilation and catecholamines, length of PICU stay and mortality were also recorded. Prevalence of VDD [25(OH)D level <50 nmol/L] was higher among critically ill children with sepsis compared to healthy controls. VDD was not associated with any significant difference in baseline demographic variables or risk factors for VDD. Although there was a trend toward increased PRISM III score, septic shock, MODS, HCAI, need for mechanical ventilation and catecholamines, length of PICU stay, and mortality, the difference was not statistically significant. Authors concluded that a high prevalence of VDD in critically ill children with sepsis was found but it was not associated with greater severity of illness or other clinical outcomes.

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