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“Rethinking Radiology: The Limited Value of Head CT Scans in Pediatric Seizure Diagnosis and Treatment”

Head Computed Tomography (CT) scans are frequently conducted in emergency departments to evaluate pediatric patients with seizure or seizure-like activity. While these scans can offer some insights, they also expose pediatric patients to potentially harmful ionizing radiation and often do not yield clinically significant findings. Despite these risks and limitations, the practice remains common, largely driven by parental concern and the desire for reassurance about their child's health. To better understand the actual value of these scans, this study evaluated the utility of head CT scans in providing diagnostic and treatment-relevant information for pediatric patients presenting with seizure or seizure-like activity.

A retrospective chart review was conducted on 90 pediatric patients, aged one to 17 years, who presented with seizure or seizure-like activity at Our Lady of the Lake Children's Hospital in Baton Rouge, Louisiana, and underwent a head CT scan. Data collected included patient demographics, seizure characteristics (focality, duration, new or recurrent, incited or isolated, febrile or afebrile), neurological exam results, total number of CTs, other imaging studies, past medical and family history, and COVID-19 vaccination status. Patients with hydrocephalus, macrocephaly, and head injuries were excluded.

Of the 90 cases reviewed, only 27% (n=24) had abnormal CT findings. Importantly, none of these findings were deemed medically or surgically significant in the context of seizure management. Among the abnormal results, 87% (n=21) were incidental to a seizure diagnosis, often revealing ear, nose, and throat (ENT) issues requiring otolaryngologist follow-up. The remaining cases (n=3) were categorized as "abnormal, other," involving conditions such as anoxic brain injury or cerebral atrophy but still did not impact immediate seizure treatment.

The study results demonstrate that head CT scans rarely yield findings that significantly impact the management of pediatric patients with seizure or seizure-like activity. Given the low diagnostic value and the risks associated with ionizing radiation, routine use of head CT in these cases should be reconsidered. This further highlights the need for educational and communication strategies to inform concerned parents about the risks of unnecessary radiation exposure and support healthcare providers in making evidence-based decisions. By reconsidering the routine use of CT scans in this patient population, we can enhance patient care and reduce unnecessary procedures. Our findings strongly advocate for reevaluating the use of head CT in pediatric seizure evaluation.