

Bedside monitoring of hypoxic ischemic brain injury using low-field, portable brain magnetic resonance imaging after cardiac arrest

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Study

In this retrospective, single-center study, clinicians evaluated patients admitted to the Yale New Haven Hospital intensive care unit (ICU) with portable MRI (pMRI) after resuscitation from cardiac arrest (CA). The study objectives were to assess the safety of pMRI and its ability to detect hypoxic-ischemic brain injury (HIBI), a common cause of morbidity in patients successfully resuscitated after CA. Researchers compared findings on pMRI with conventional MRI.

Results

"[Team] performed 22 low-field MRI examinations in 19 patients resuscitated from CA (68.4% male, mean [standard deviation] age, 51.8 [13.1] years). Twelve patients (63.2%) had findings consistent with HIBI on conventional neuro-imaging radiology report. Low-field MRI detected findings consistent with HIBI in all of these patients. Low-field MRI was acquired at a median (interquartile range) of 78 (40–136)

hours post-arrest. Quantitatively, [they] measured FLAIR signal intensity in three regions of interest, which were higher amongst patients with confirmed HIBI. Low-field MRI was completed in all patients without disruption of intensive care unit equipment monitoring and no safety events occurred."

Conclusion from the Abstract

"In a critically ill CA population in whom MR imaging is often not feasible, low-field MRI can be deployed at the bedside to identify HIBI. Low-field MRI provides an opportunity to evaluate the time-dependent nature of MRI findings in CA survivors."

Relevance of the Study

This study is the first to demonstrate the use of portable MRI for follow-up of patients resuscitated from a cardiac arrest for hypoxic-ischemic brain injury (HIBI). The results suggest that pMRI may be used successfully to identify patients with HIBI in a critical care setting.