The Value of Scheduled Repeat Cranial Computed Tomography Following Mild Head Injury: Single Center Experience and Meta-Analysis

Saleh A. Almenawer MD; Julia Bogza; Blake Yarascavitch MD; Niv Sne; Forough Farrokhyar; Naresh Murty; Kesava Reddy

MD

Division of Neurosurgery, McMaster University, Hamilton, Ontario, Canada

BACKGROUND:

Following an initial CT scan revealing intracranial hemorrhage after traumatic brain injury, a standard of care in many trauma centers is to schedule a repeat CT scan to rule out possible progression of the bleed.

OBJECTIVE:

While repeat imaging is clearly indicated to assess a deteriorating patient, we evaluate the utility of routine follow-up CT in changing the management of mild head injury patients despite clinical stability. **METHODS:**

The trauma database at our institution was retrospectively reviewed to identify patients following mild head injury with positive initial CT finding and scheduled repeat scan. The literature was searched for similar published studies. Patients were divided into two groups for comparison. Group A included patients who had intervention based on neurological exam changes. Group B comprised patients requiring change in management according to CT results exclusively. The meta-analysis was performed using random-effects model. **RESULTS:**

Overall, 15 studies and 445 patients from the current series met our eligibility criteria totalling 2693 patients. The intervention rates for group A and B were 2.7% (95% CI 1.7–3.9) with P = .003 and 0.6% (95% CI 0.3–1) with P = .212, respectively. The statistical difference between both intervention rates was clinically significant with P < .001.

CONCLUSION:

The available evidence indicates that it is unnecessary to schedule a repeat CT scan following mild head injury when patients are unchanged or improving neurologically. In the absence of supporting data, we question the value of routine follow-up imaging given the associated accumulative increase in cost and risks.



CI 0.3–1, P = .212).

			Fi	gure	3		
tudy or ubgroup	Total Patients No.	Total No. Interventi	of Interv ions Neuro Based	entions logically	Point of Es and (95% (timate Point of Estimat CI)	e and (95% C
ifri 2004	202	5	5		0.025(0.008	3,0.057)	
ainardi 2004	60	0	0		0.000(0.000),0.060)	
hieregato 2005	84	0	0		0.000(0.000),0.043)	
elmahos 2006	179	7	7		0.039(0.016	5,0.079)	
luynh 2006	56	0	0		0.000(0.000),0.064)	
ifri 2006	130	2	2		0.015(0.002	2,0.054)	
rown 2007	72	5	5		0.069(0.023	3,0.155)	
mith 2007	43	2	2		0.047(0.006	5,0.158)	
ollingworth 20	07 257	3	3		0.012(0.002	2,0.034)	-8
uredi 2008	41	0	0		0.000(0.000),0.086)	
oka 2008	32	2	2		0.063(0.008	3,0.208)	
ee 2009	207	16	11		0.053(0.027	7,0.093)	
homas 2010	457	17	9		0.020(0.005	7,0.037)	-
IIII 2011 Zashinatan 201	2 221	4	0		0.056(0.021	1,0.118)	
vasinington 201	2 321	+	3		0.009(0.002	2,0.027)	-
intent series	2603	25	23		0.032(0.033	7.0.039)	
orrest on ne	plot pro urologic	esent al ex	s the i am ch	nterv ange	entior s (gro	n rates based oup A) of all s	l mainl tudies
TABLE 1 Sum	mary of the outc	ames of elig	Ti ible studies inc	able	1 e meta-analys	sis in addition to the current a	eries results"
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Author, Year Sifri, 2004 Fainardi, 2004 Chieregato, 2005	Study Design Retrospective Prospective Prospective	Total Patients No. 202 60 84	Na. of Worsened CT (%) 40 (19.8) 30 (50) 41 (48.8)	Group A 5 0 0	Group B 0 0	Type of Interventions 2 ICP monitors insertion 2 Cranitotanies 2 Increased observation ⁴ None	CT Finding Leading to Intervention N/A None None
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