ORIGINAL ARTICLE

A challenging decision for emergency physicians: Routine repeat computed brain tomography of the brain in head trauma in infants and neonates

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ABSTRACT

BACKGROUND: Head trauma is a leading cause of death and disability. While standard treatment protocols exist for severe head trauma, no clear follow-up standards are available for mild head trauma with positive imaging findings in infants and newborns. Although routine follow-up brain computed tomography (CT) imaging is not recommended for children with moderate and mild head trauma, the necessity for follow-up imaging in infants and newborns remains uncertain.

METHODS: Our study is a retrospective, observational, and descriptive study. Infants under 1 year old presenting to the emergency department with isolated head trauma were reviewed with the approval of the Ethics Committee of Ankara Etlik City Hospital. Inclusion criteria included presentation to the emergency department, undergoing more than one brain CT scan, and sustaining mild head trauma (Glasgow Coma Scale [GCS] >13). Patients with incomplete follow-up data or multiple traumas were excluded. Age, gender, mechanism of trauma, initial and follow-up brain CT findings, hospital admission, and surgical procedures were recorded and analyzed using the SPSS statistical package.

RESULTS: Out of 238 screened patients, 154 were included in the study. Of these, 66.9% were male and the average age was 5.99 months. The most common presenting symptom was swelling at the trauma site, observed in 79.2% of cases. The most common mechanism of injury was falling from a height of less than 90 cm, accounting for 85.1% of cases. Pathological progression on follow-up CT was observed in 5.2% of the patients, and only 1.9% required surgical treatment. A total of 34.4% of the patients required hospitalization. Patients with parenchymal brain pathology had a higher rate of pathological progression on follow-up CT and a longer hospital stay.

CONCLUSION: Follow-up CT scans in infants with mild head trauma do not alter patient outcomes except in cases with brain parenchymal pathology. Study data indicated that repeat imaging is not beneficial for isolated skull fractures. Imaging artifacts often necessitated repeated scans, contributing to increased radiation exposure. Unnecessary repeat imaging escalates radiation exposure and healthcare costs. Only a small percentage of patients exhibited progression of intracranial pathology, justifying follow-up imaging solely in the presence of brain parenchymal injury. Larger prospective studies are necessary to confirm these findings.

Keywords: Brain computed tomography (CT) imaging; follow-up CT; head trauma; infants; mild head trauma; newborns; radiation exposure.

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INTRODUCTION

Head trauma is recognized as one of the leading causes of death and disability.[1] Standard treatment protocols are available for patients with severe head trauma.[2] However, clear follow-up and treatment standards have not been established for patients with clinically stable mild head trauma who exhibit positive imaging findings.[3,4] Studies generally do not recommend routine repeat head computed tomography (CT) in children with moderate and mild head trauma as they do in adults. It is recommended that patient follow-up should be correlated with the clinical assessments and physical examinations instead of routine repeat head CT scans.[5] However, the utility of routine repeat head CT in infants and newborns is still uncertain due to challenges such as difficulties in conducting physical examinations and clinical correlations.

Although there are alternative methods for imaging head trauma in infants and neonates, CT is accepted as the gold standard despite its associated radiation risk. In cases of serious injury, generally accepted approaches are employed in infants and neonates, as in adults and older children.[6] However, there are some obstacles in clinical follow-up for infants and neonates with moderate and mild head trauma because they have limited self-expression and communication skills. Therefore, the Glasgow Coma Scale (GCS) is calculated as pediatric GCS, based on different parameters for children under 2 years of age.[6,7] Additionally, some studies have shown progression of intracranial pathology detected on brain CT in 18% of patients without any clinical signs and symptoms.[5] This situation prompts clinicians to request more frequent routine repeat head CTs to stay within the safe range. Moreover, unnecessary CT scans are associated with an increased risk of malignancy due to the higher radiation load for patients, especially infants and neonates, in subsequent years.[8] The additional costs of unnecessary scans should also be considered.[9]

When the literature is reviewed, there are very few studies questioning the necessity of brain CT in the follow-up of head trauma in infants and neonates.[10,11] The level of evidence for the recommendations from these studies is not clear. These uncertainties complicate the clinical decision-making process, especially in infants with limited ability to express themselves. Therefore, it is not possible to generalize the recommendations for adults and older children to infants and newborns. In our study, we aimed to contribute to the literature in this field by questioning the necessity of routine repeat head CT scans in the follow-up of infants with head trauma.

MATERIALS AND METHODS

Our study is a retrospective, observational, and descriptive study. Our research was approved by the Clinical Research Ethics Committee of Ankara Etlik City Hospital with the decision dated January 31, 2024, and numbered AEŞH-EK1-2023-755, and was initiated following this approval. In our study, patients admitted to the emergency department with isolated head trauma were analyzed. The examination was performed through the Hospital Information Management System (HIS), and patients who were brought to the emergency department trauma area under the age of 1 year and whom the physicians deemed appropriate for routine repeat head CT were included. In this system review, applications between November 1, 2022 and November 1, 2023 were analyzed.

Inclusion Criteria:

- Being admitted to the emergency department by relatives
- CT scan of the brain performed on patients under 1 year of age
- Isolated head trauma as the reason for admission
- Patients with mild head trauma (GCS >13)[6,12]

Exclusion Criteria:

- Missing follow-up data
- Patients with multiple traumas.

A fall of 90 cm or more was accepted as high-energy trauma.[13] In the study, age (in months), gender, trauma mechanisms, Glasgow Coma Scores (age-matched pediatric GCS), findings on brain tomography, admission symptoms, additional symptoms that developed during follow-up, whether there was progression in pathological findings on routine repeat head CT, hospitalization status, number of days hospitalized, and surgical procedures performed were recorded using the data collection form. Hospitalization and surgical procedures as a result of routine repeat head CT were considered study outcomes.

Statistical Analysis

The SPSS statistical software package was used for the statistical analysis of the data. In the descriptive findings section of the statistical analysis, categorical variables were presented as number and percentage, and continuous variables were presented as mean ± standard deviation (SD) for normally distributed data and median (minimum, maximum) for non-normally distributed data. The conformity of continuous variables to normal distribution was evaluated using visual (histogram and probability graphs) and analytical methods (Kolmogorov-Smirnov and Shapiro-Wilk tests). Mann-Whitney U and Chi-square tests were used for pairwise comparisons. The cut-off value for lactate level was determined by Receiver Operating Characteristic (ROC) analysis. The statistical significance level was accepted as $p<0.05$.

RESULTS

In our study, 238 patients were identified as a result of system screening. After applying the exclusion criteria, the study was completed with 154 patients. The patient enrollment schema and excluded patients are presented in Figure 1.

Among the patients included in the study, 103 (66.9%) were males and 51 (33.1%) were females. The mean age was 5.99 months and the median GCS value was 15. The most common

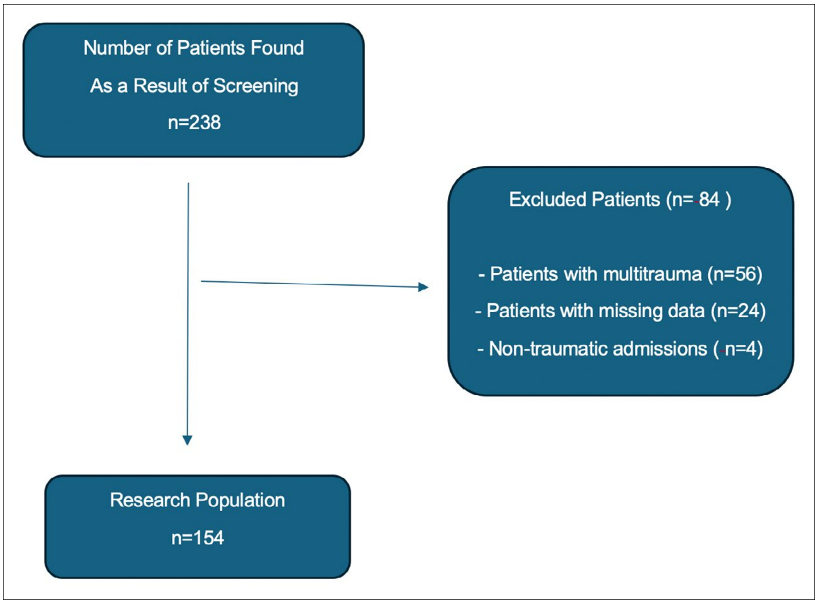

Figure 1. Patient admission flowchart.

presenting symptom was swelling at the site of trauma in 122 (79.2%) cases, followed by vomiting in 12 (7.8%) cases. The most common mechanism of trauma was a fall from a height of less than 90 cm in 131 (85.1%) cases, followed by falls from a height of more than 90 cm in 11 (7.1%) cases, impact in 9 (5.8%) cases, and in-vehicle traffic accidents (IVTA) in 3 (1.9%) cases. The first tomography was normal in 56 (36.4%) cases, a parietal bone fracture was found in 43 (27.9%) cases, and a frontal bone fracture was found in 16 (10.4%) cases. While the listed fractures were reported as single bone fractures, 4 (2.6%) patients had fractures in more than one bone. In parenchymal evaluations, brain CT was normal in 90 (58.4%) cases, contusion was found in 12 (7.8%) cases, and subarachnoid haemorrhage (SAH) was found in 9 (5.8%) cases. In 6 (3.9%) cases, extra-axial pathology was found, while 2 (1.3%) cases had findings compatible with congenital disease. Progression in pathologies was observed in 8 (5.2%) patients with routine repeat head CT, and surgical treatment was needed in only 2 (1.3%) of these patients. In total, only 3 (1.9%) cases required surgical treatment. During the follow-up period, only 1 patient with a subdural hematoma experienced a change in consciousness and required surgical treatment. Fifty-three (34.4%) patients were hospitalized, and 101 (65.6%) were discharged with recommendations. The mean hospitalization duration was 1.08 days (standard deviation [SD] 2.94 days) (Table 1).

In 8 patients, pathological progression was found on routine repeat head CT, and all of these patients were hospitalized. When comparing patients with and without pathology in bone structure evaluation in terms of pathological progression after routine repeat head CT, no statistically significant difference was found (p=0.59). Patients with brain parenchymal pathology had a higher rate of pathological progression in routine repeat head CT, and the difference between the groups was statistically significant (p<0.001). When comparing the hospitalization durations of patients with and without changes in routine repeat head CT, the result was statistically significant (p<0.001) (Table 2).

Comparison of the conditions that may affect the need for hospitalization and surgical procedures is given in Table 3. P values could not be given when some values in the table were lower than expected and more than 25%. P values could not be provided for the relationship between admission findings and trauma mechanism in terms of hospitalization and surgical procedures. There was no statistically significant difference between patient gender and the need for hospitalization and surgical procedures. There was also no statistically significant difference in hospitalization and surgical procedures according to the presence or absence of bone injury on CT (p=0.6, p=0.61). Hospitalization and surgical procedures were more common in patients with brain parenchymal injuries, and this was statistically significant (p<0.001, p=0.014). Similarly, the rate of hospitalization and surgical procedures was higher in patients with routine repeat head CT according to the increase in detected pathology, and this was statistically significant (p<0.001, p=0.007). (Table 3)

DISCUSSION

Our study is one of the largest population-based studies investigating the efficacy of routine repeat head CT in patients under 1 year of age with mild to moderate head trauma. Our results showed that routine repeat head CT did not change patient outcomes except for brain parenchymal pathology identified in the first CT scan. Additionally, we found that artifacts may be the cause of increased radiation, and routine repeat head CT did not change patient outcomes.

In our study population, males were almost twice as prevalent as females. Similar rates are found in other studies in the literature examining infants and newborns.[10,11] In the review by Dewan et al. on the epidemiology of pediatric traumas, it

Table 1. Demographic characteristics of the patients and brain computed tomography (CT) and clinical follow-up information

			n (%)
Sex			
Females			51 (33.1)
Males			103 (66.9)
Age Mean (SD), Median (25-75%) (Months)	5.99 (3.42)	6 (3-9)	
GCS Median (25-75%)			15 (15-15)
Trauma Mechanism			
Fall <90 cm			131 (85.1)
Fall >90 cm			11 (7.1)
Collision			9 (5.8)
IVTA			3 (1.9)
CT Bone Assessments			
Normal			56 (36.4)
Parietal fracture			43 (27.9)
Frontal fracture			16 (10.4)
Occipital fracture			15 (9.7)
Temporal fracture			2 (1.3)
More than one fracture			4 (2.6)
Artifact			18 (11.7)
Parenchymal Assessment			
Normal			90 (58.4)
Contusion			12 (7.8)
Subarachnoid hemorrhage			9 (5.8)
Subdural hemorrhage			7 (4.5)
Epidural hemorrhage			6 (3.9)
Intraparenchymal hemorrhage			4 (2.6)
Artifact			18 (11.7)
Findings of Submission			
Swelling			122 (79.2)
Vomiting			12 (7.8)
Seizure			5 (3.2)
Altered state of consciousness			6 (3.9)
Fall			7 (4.5)
Cuts			2 (1.3)
Additional Symptom Development at Follow-up			
Yes			1 (0.6)
No			153 (99.4)
Progression on Control Brain CT			
Yes			8 (5.2)
No			146 (94.8)
Hospital Admission			
Yes			53 (34.4)
No			101 (65.6)
Surgical Procedure			
Yes			3 (1.9)
No			151 (98.1)
Number of Hospitalization Days Mean (SD), Median (25-75%)	1.08 (2.94)	1 (0-3.5)	

IVTA: In-Vehicle Traffic Accident; CT: Computed Tomography; SD: Standard Deviation; GCS: Glascow Coma Scale.

Table 2. The relationship between bone and parenchymal injury and length of hospitalization according to pathological progression status on control brain CT

	Progression on Control Brain CT			
	Yes n (%)	**No n (%)**	**Total n (%)**	**P**
CT Bone Pathology				
No	4 (50)	70 (47.9)	74 (48.1)	0.59*
Yes	4 (50)	76 (52.1)	80 (51.9)	
Brain CT Parenchymal Pathology				
No	1 (12.5)	115 (78.8)	108 (75.3)	<0.001*
Yes	7 (87.5)	37 (21.2)	46 (24.7)	
Length of Hospitalization	Yes median (25-75%)	No median (25-75%)		<0.001**
	3.5 (2.25-8.75)	0 (0-1)		

*Fisher's exact test. **Mann-Whitney U test. CT: Computed Tomography.

Table 3. The relationship between demographic information, brain CT results, and hospitalization and surgical procedures

	Hospital Admission			Surgical Procedure		
	No	**Yes**	**P**	**No**	**Yes**	**P**
Admission Finding						
Subcutaneous edema/hematoma	81	41		120	2	
Vomiting	9	3		12	0	
Seizure	0	5		4	1	
Altered state of consciousness	3	3		6	0	
Fall	6	1		7	0	
Cuts	2	0		2	0	
Gender						
Male	66	37	0.57*	101	2	1**
Female	35	16		50	1	
Trauma Mechanism						
Fall < 90 cm	87	44		128	3	
Fall > 90 cm	7	4		11	0	
Impact	7	2		9	0	
IVTA	0	3		3	0	
Bone Pathology						
No	47	27	0.6*	72	2	0.61**
Yes	54	26		79	1	
Brain Parenchymal Pathology						
No	94	22	<0.001*	116	0	0.014**
Yes	7	31		35	3	
Progression on Control Brain CT						
No	101	45	<0.001**	145	1	0.007**
Yes	0	8		6	2	

*Pearson Chi-Square test. **Fisher's exact test. IVTA: In-Vehicle Traffic Accident; CT: Computed Tomography.

is noted that males generally experience trauma more frequently, yet the gender distribution is equal under the age of 3 years.[14] The reason is attributed to males being more physically active. However, as observed in our study and similar studies, the male gender consistently experiences a higher rate of trauma from birth.

Imaging was repeated in approximately 12% of the patients due to acquisition artifacts. Clinicians favor tomography because it is a rapid imaging technique that does not require sedation compared to magnetic resonance imaging.[15] However, compliance is almost impossible in infants. We found that imaging, which has no diagnostic value due to motion artifacts in children for whom imaging is planned, leads to repeated imaging and increased radiation load. This is an important consideration for repeat imaging.

When pathology is detected in brain CT scans performed due to trauma, progression may be observed in approximately 25% of patients in follow-up CT scans.[5] The rate in our study is one of the lowest in the literature. It has been shown that progression is associated with neurological deterioration in adults and those aged 2 to 18 years.[16,17] In the literature, patients under 2 years of age have been excluded from studies due to limitations in neurological examination.[7,16] Therefore, there are few studies that specifically examine this population.[10,11] In their study, Utsumi et al. did not recommend routine repeat head CT without neurological deterioration for children under 2 years of age.[11] Engel et al. recommended routine repeat head CT in cases of positive imaging in patients under 1 year of age.[10] It has been shown that there are center-based differences in routine repeat head CT in cases of bleeding in the pediatric population.[18] In our study, clinical deterioration was reported in only 1 patient, while progression was observed in the routine repeat head CT of 8 patients. Although there was no significant progression on routine repeat head CT in skull fractures, a statistically significant change was observed on routine repeat head CT in cases of intracranial pathology. This justifies routine repeat head CT only in the presence of intracranial pathology. No differences were observed in the imaging of skull fractures only or when the initial imaging was normal.

When routine repeat head CT was analyzed, progression was observed at a higher rate in patients with parenchymal pathology. It was observed that these patients had a longer hospitalization period. Some studies justify routine repeat head CT in moderate and severe traumas.[19]

There are also studies that associate routine repeat head CT only with clinical deterioration.[3] In these studies, the severity of head trauma was measured by the Glasgow Coma Scale. Although these clinically based classifications have some advantages, some injuries that may progress with developing imaging systems may be missed. Our study consisted of mild head traumas, even if the patients had positive imaging findings. Our results show that routine repeat head CT is justified in cases of brain parenchymal injury, but in other cases, routine repeat head CT is unnecessary for mild injuries.

Our study has some limitations. The retrospective design of our study is an important limitation. Due to the retrospective design, we could not standardize the protocol by which repeat extractions were performed. Additionally, our study was performed at a single center. More significant results could be obtained with an increased number of cases in multiple centers. We also consider the inclusion of long-term results of discharged patients as a limitation. Although it may seem like a limitation that our study included only mild head traumas, we view this as a strength of the study and believe that we have contributed to filling an important gap in the literature. Although the clinical consensus for mild head trauma is a GCS score of 14 and above, some clinicians accept it as 13 points and above.[6,12] In our study, we accepted the definition of mild head trauma as a GCS score of 14 and above.

CONCLUSION

In light of our findings, we conclude that repeat imaging in infants and neonates with mild head trauma is necessary in the presence of intracranial pathology. In cases such as isolated skull fractures, we found that routine repeat head CT did not change patient outcomes. We found that artifacts and clinicians' concerns were the reasons for increased repeat imaging in infants and newborns with limited follow-up and treatment compliance. Validation studies with a prospective design and higher numbers of patients are needed to confirm our data.

Ethics Committee Approval: This study was approved by the Ankara Etlik City Hospital Ethics Committee (Date: 31.01.2024, Decision No: AEHŞ-EK1-2023-755).

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Authorship Contributions: Concept: B.K., N.İ.I., Y.Y., D.T.; Design: B.K., Ö.F.T., D.T., A.B.; Supervision: B.K., S.D., Y.Y., E.D., A.B.; Resource: N.İ.I., Ö.F.T., E.D., A.B.; Materials: Ö.F.T., S.D., Y.Y., A.B.; Data collection and/or processing: N.İ.I., S.D., Y.Y., E.D., A.B.; Analysis and/or interpretation: B.K., S.D., Y.Y., E.D., D.T.; Literature search: N.İ.I., Ö.F.T., S.D., E.D.; Writing: B.K., N.İ.I., Ö.F.T., D.T.; Critical review: B.K., D.T.

Conflict of Interest: None declared.

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REFERENCES

1. Brommeland T, Helseth E, Aarhus M, Moen KG, Dyrskog S, Bergholt B, et al. Best practice guidelines for blunt cerebrovascular injury (BCVI). Scand J Trauma Resusc Emerg Med 2018;26:90. [CrossRef]
2. Shaikh F, Waseem M. Head Trauma. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–.
3. Brown CV, Zada G, Salim A, Inaba K, Kasotakis G, Hadjizacharia P, et al. Indications for routine repeat head computed tomography (CT) stratified by severity of traumatic brain injury. J Trauma 2007;62:1339–44; discussion 1344–5. [CrossRef]
4. Stippler M, Smith C, McLean AR, Carlson A, Morley S, Murray-Krezan

C, et al. Utility of routine follow-up head CT scanning after mild traumatic brain injury: a systematic review of the literature. Emerg Med J 2012;29:528–32. [CrossRef]
5. Mizu D, Matsuoka Y, Huh JY, Onishi M, Ariyoshi K. Head CT findings and deterioration risk in children with head injuries and Glasgow Coma Scales of 15. Am J Emerg Med 2021;50:399–403. [CrossRef]
6. Haydel MJ, Weisbrod LJ, Saeed W. Pediatric Head Trauma. 2024 Feb 16. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–.
7. Schutzman SA, Barnes P, Duhaime AC, Greenes D, Homer C, Jaffe D, et al. Evaluation and management of children younger than two years old with apparently minor head trauma: proposed guidelines. Pediatrics 2001;107:983–93. [CrossRef]
8. Pearce MS, Salotti JA, Little MP, McHugh K, Lee C, Kim KP, et al. Radiation exposure from CT scans in childhood and subsequent risk of leukaemia and brain tumours: a retrospective cohort study. Lancet 2012;380:499–505. [CrossRef]
9. Çalik M, Ersoy AH, Ekin EE, Öztürk D, Güleç SG. Assessment of cost-effectiveness of computerized cranial tomography in children with mild head trauma. Diagnostics (Basel) 2022;12:2649. [CrossRef]
10. Engel EP, Bitter B, Reyes J, Grundmeyer R, Helmer SD, Haan JM. Should infants with blunt traumatic brain injuries and intracranial hemorrhage have routine repeat imaging? Kans J Med 2023;16:117–20. [CrossRef]
11. Utsumi S, Ohnishi S, Amagasa S, Sasaki R, Uematsu S, Kubota M. Role of routine repeat head CT for pediatric patients under 2 years old with mild-to-moderate traumatic brain injury. Neurol Med Chir (Tokyo) 2022;62:133–9. [CrossRef]
12. Hageman G, Nihom J. A child presenting with a Glasgow Coma Scale score of 13: mild or moderate traumatic brain injury? A narrative review. Neuropediatrics 2022;53:83–95. [CrossRef]
13. Kuppermann N, Holmes JF, Dayan PS, Hoyle JD Jr, Atabaki SM, Holubkov R, et al; Pediatric Emergency Care Applied Research Network (PECARN). Identification of children at very low risk of clinically-important brain injuries after head trauma: a prospective cohort study. Lancet. 2009;374:1160–70. Erratum in: Lancet 2014;383:308.
14. Dewan MC, Mummareddy N, Wellons JC 3rd, Bonfield CM. Epidemiology of global pediatric traumatic brain injury: qualitative review. World Neurosurg 2016;91:497–509.e1. [CrossRef]
15. Kralik SF, Yasrebi M, Supakul N, Lin C, Netter LG, Hicks RA, et al. Diagnostic performance of ultrafast brain MRI for evaluation of abusive head trauma. AJNR Am J Neuroradiol 2017;38:807–13. [CrossRef]
16. Aziz H, Rhee P, Pandit V, Ibrahim-Zada I, Kulvatunyou N, Wynne J, et al. Mild and moderate pediatric traumatic brain injury: replace routine repeat head computed tomography with neurologic examination. J Trauma 2013;75:550–4. [CrossRef]
17. Stippler M, Smith C, McLean AR, Carlson A, Morley S, Murray-Krezan C, et al. Utility of routine follow-up head CT scanning after mild traumatic brain injury: a systematic review of the literature. Emerg Med J 2012;29:528–32. [CrossRef]
18. Chaudhari PP, Pineda JA, Bachur RG, Khemani RG. Trends and variation in repeat neuroimaging for children with traumatic intracranial hemorrhage. J Am Coll Emerg Physicians Open 2021;2:e12400. [CrossRef]
19. Bata SC, Yung M. Role of routine repeat head imaging in paediatric traumatic brain injury. ANZ J Surg 2014;84:438–41. [CrossRef]

ORİJİNAL ÇALIŞMA - *ÖZ*

Acil tıp hekimleri için zor bir karar: Bebekler ve yenidoğanlarda kafa travmasında rutin tekrarlayan bilgisayarlı beyin tomografisi

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AMAÇ: Kafa travması, ölüm ve sakatlığın önde gelen nedenleir. Ağır kafa travması için standart tedavi protokolleri mevcutken, bebeklerde ve yenidoğanlarda pozitif görüntüleme bulguları olan hafif kafa travmaları için net takip standartları bulunmamaktadır. Orta ve hafif kafa travması olan çocuklarda kontrol beyin BT görüntülemesi rutin olarak önerilmezken, bebekler ve yenidoğanlarda kontrol görüntüleme ihtiyacı belirsizliğini korumaktadır.

GEREÇ VE YÖNTEM: Çalışmamız retrospektif, gözlemsel ve tanımlayıcı bir çalışmadır. Ankara Etlik Şehir Hastanesi Etik Kurulu onayı ile acil servise izole kafa travması ile başvuran 1 yaş altı hastalar incelendi. Dahil edilme kriterleri arasında acil servise başvuru, birden fazla beyin BT çekilmesi ve hafif kafa travması (GKS >13) yer aldı. Eksik takip verileri veya çoklu travması olan hastalar hariç tutuldu. Yaş, cinsiyet, travma mekanizması, ilk ve kontrol beyin BT bulguları, hastaneye yatış ve cerrahi işlemler kaydedildi ve SPSS istatistik paketi kullanılarak analiz edildi.

BULGULAR: Tarama sonucu bulunan 238 hastadan 154'ü çalışmaya dahil edildi. Bu 154 hastanın %66.9'u erkekti ve yaş ortalaması 5.99 aydı. En sık başvuru semptomu %79.2 ile travma bölgesinde şişlikti. En sık görülen travma mekanizması %85.1 ile düşme (<90 cm) idi. Kontrol BT'de patolojik ilerleme hastaların %5.2'sinde gözlendi ve yalnızca %1.9'unda cerrahi tedavi gerekti. Hastaların %34.4'ü hastaneye yatırıldı. Beyin parankimal patolojisi olan hastalar, kontrol BT'de daha yüksek oranda patolojik ilerleme ve daha uzun hastanede kalış gösterdi.

SONUÇ: Hafif kafa travmalı bebeklerde kontrol beyin BT taramaları, beyin parankimal patolojisi olan vakalar dışında hasta sonuçlarını değiştirmemektedir. Çalışma verileri izole kafatası kırıklarında tekrar görüntülemenin faydası olmadığını gösterdi. Görüntüleme artefaktları, taramaların tekrarlanmasını gerektirmiş ve bu da radyasyona maruz kalmanın artmasına katkıda bulunmuştur. Gereksiz tekrarlanan görüntüleme, radyasyona maruz kalmayı ve maliyetleri artırmaktadır. Hastaların küçük bir yüzdesinde intrakraniyal patolojinin ilerlemesi gözlendi, bu da kontrol görüntülemenin yalnızca beyin parankimal hasarı varlığında yapılmasını haklı göstermektedir. Bu bulguları doğrulamak için daha büyük örneklem büyüklüğüne sahip prospektif çalışmalara ihtiyaç vardır.

Anahtar sözcükler: Bebekler; beyin BT görüntülemesi; hafif kafa travması; kafa travması; kontrol BT; radyasyon maruziyeti; yenidoğanlar.

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