J Anal Res Clin Med, 2016, 4(2), 75-6.
doi: 10.15171/jarcm.2016.012, *http://journals.tbzmed.ac.ir/JARCM*

Editorial

Diagnostic value of brain natriuretic peptide in head trauma

Farzad Rahamni*[1]

[1] *Assistant Professor, Emergency Medicine Research Team AND Road Traffic Injury Research Center, Tabriz University of Medical Sciences, Tabriz, Iran*

Trauma, especially head trauma, is one of the major problems in the health system and is the leading cause of death among young people worldwide.[1] Head and neck is the most common site of injury caused by multiple traumas.[2] Motor vehicle accidents, falls from heights, and injuries from weapons are the most common causes of brain injury. 80% of head injuries are minor, 10% are moderate, and 10% are major injuries.[3] Computerized tomography (CT) scans are commonly requested for patients with traumatic brain injury. Brain CT scan is very important because of rapid assessment and diagnosis of brain trauma in cases which require emergency surgery.[4] Unfortunately, it is an expensive radiographic method that is not available everywhere; on the other hand, it exposes the patients to radiation.[5]

Brain natriuretic peptide (BNP) is a hormone originates from the heart, mainly. Considering the function and structure, it resembles atrial natriuretic factor. These two hormones are involved in the volume regulation and cardiovascular homeostasis. High plasma levels of BNP are observed in patients with cardiovascular disorders, stroke, traumatic brain injury and disorders of the blood-brain barrier.[6] BNP has immunoreactivity activities in the human brain, including the cerebral cortex, hypothalamus, cerebellum, and pons.[7] The heart muscle and sub-cortical brain tissue are supplied by the distal arteries without anastomosis. Therefore, these parts are vulnerable to loss of blood supply. Thus, disorders such as endothelial dysfunction, atherosclerosis, hypertension, anemia, and head injury cause disruption of endothelial cells and increase the level of this peptide.[8]

Demir et al. concluded that BNP level is not a sufficient marker for detection of intracranial pathologies in case of minor head trauma and there is no relationship between the severity of the injury and BNP levels.[4] While other studies have suggested that measuring BNP is useful in determining the indications of brain CT scan.[7,9] In one study, BNP of more than 10 pg/ml reported to have 61% sensitivity, 94% specificity, 93% positive predictive value, and 64% negative predictive value in predicting intracranial pathology.[7] Akgun et al. have also concluded that N-terminal (NT)-proBNP levels are higher in patients with more extensive brain lesions than patients with small lesions.[9]

Some studies suggest that BNP levels increase in head trauma, while others have stated no increase in BNP levels in head trauma. Previous studies have thus recommended further studies. Therefore, due to the existing conflicts, more studies are required to determine the diagnostic value of BNP in diagnosing brain injury following trauma.

* **Corresponding Author:** Farzad Rahmani MD, Email: rahmanif@tbzmed.ac.ir

Citation: Rahamni F. **Diagnostic value of brain natriuretic peptide in head trauma.** J Anal Res Clin Med 2016; 4(2): 75-6. Doi: 10.15171/jarcm.2016.012

References

1. Aenderl I, Gashaw T, Siebeck M, Mutschler W. Head injury--a neglected public health problem: a four-month prospective study at Jimma University Specialized Hospital, Ethiopia. Ethiop J Health Sci 2014; 24(1): 27-34. DOI: 10.1016/j.amjcard.2006.02.062
2. Woertgen C, Rothoerl RD, Metz C, Brawanski A. Comparison of clinical, radiologic, and serum marker as prognostic factors after severe head injury. J Trauma 1999; 47(6): 1126-30.
3. Gunstad J, Poppas A, Smeal S, Paul RH, Tate DF, Jefferson AL, et al. Relation of brain natriuretic peptide levels to cognitive dysfunction in adults > 55 years of age with cardiovascular disease. Am J Cardiol 2006; 98(4): 538-40. DOI: 10.1016/j.amjcard.2006.02.062
4. Demir A, Kavalci C, Yilmaz MS, Yilmaz F, Durdu T, Ceyhan MA, et al. The value of serum BNP for diagnosis of intracranial injury in minor head trauma. World J Emerg Surg 2014; 9(1): 16. DOI: 10.1186/1749-7922-9-16
5. Hassan A, Hunt BJ, O'Sullivan M, Parmar K, Bamford JM, Briley D, et al. Markers of endothelial dysfunction in lacunar infarction and ischaemic leukoaraiosis. Brain 2003; 126(Pt 2): 424-32. DOI: 10.1093/brain/awg040
6. Çevik Y, Durukan P, Serhat Erol F, Yildiz M, Ilhan N, Serhatlioglu S. Diagnostic value of bedside brain natriuretic peptide measurement in patients with head trauma. JAEM 2010; 9(1): 21-5. DOI: 10.4170/JAEM.2009.93823
7. Sviri GE, Soustiel JF, Zaaroor M. Alteration in brain natriuretic peptide (BNP) plasma concentration following severe traumatic brain injury. Acta Neurochir (Wien) 2006; 148(5): 529-33. DOI: 10.1007/s00701-005-0666-4
8. Kavalci C, Akdur G, Yemenici S, Sayhan MB. The value of serum BNP for the diagnosis of intracranial injury in head trauma. Tr J Emerg Med 2012; 12: 112-6.
9. Akgun B, Erol FS, Yildirim H, Ilhan N, Kaplan M. The correlation of serum NT-proBNP levels of hemorrhagic and ischemic lesions detected with diffusion MRI in head traumas. Turk Neurosurg 2013; 23(3): 336-43. DOI: 10.5137/1019-5149.JTN.6982-12.1