

Journal Club Synopsis

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Is CT imaging necessary in minor head injury patients taking antiplatelet agents?

Clinical Scenario:

You are working a shift in the emergency department. You already have a full pod and two more patients are placed in the hallway directly in front of you. As you begin your assessment you find that they are a couple. The man is 70 and his wife is 62. They were walking in the park when they both tripped and pulled each other down. They both have head injuries from striking their heads on the cement walk. The elderly man has abrasions across his face and his wife has a 1.5 cm laceration to her forehead. They deny any other injuries and are seated next to each other, enjoying each other's company. The husband states the only reason he checked in is because his wife made him. He states he is there to be with her while she gets sewn up. They both have a GCS of 15 and no other injury. There was no LOC in either patient. You review their charts to discover that the man is taking plavix and aspirin for a TIA he had several years ago and his wife is taking low dose aspirin daily.

Is computed tomography required in these individual patients?

Introduction: The minor head injury patient presents a dilemma to the emergency medicine physician. The physician is presented with a patient who may have no sign of trauma, reports no loss of consciousness, and describes a minor occurrence. A large portion of these patients are taking some form of antiplatelet and/or anticoagulant medication. The literature has been clear about anticoagulant therapy and the increase risk of intracranial hemorrhage. It would be efficient from an emergency medicine perspective to avoid the cost and time required to CT these patients in a lower risk subset. The question that is looked at through this journal club includes some current literature on anticoagulant use in an effort to remind ourselves of the literature as well as discuss the different approaches to this patient; this journal club also looks at the antiplatelet therapy patient, and specifically aspirin-only patients in effort to consider whether minor head injury patients taking aspirin indeed require CT imaging.

Article 1: Immediate and Delayed Traumatic Intracranial Hemorrhage in Patients With Head Trauma and Preinjury Warfarin or Clopidogrel Use. *Annals of Emergency Medicine*. 2012 June; (59):460-468. Nishijima, D.K., et. al.

This study was a prospective observational study performed at 6 hospitals (2 trauma centers, 4 community hospitals). This study looked at blunt head trauma with preinjury clopidogrel or warfarin use. A total of 1064 patients were enrolled. The patients were followed for a period of two weeks. 1000 of the 1064 patients received a CT scan of the

head. The prevalence of intracranial hemorrhage (ICH) was higher (12.0%) in the clopidogrel group compared to (5.1%) the warfarin group. Delayed intracranial hemorrhage was found to be 0.6% in the warfarin group and 0% in the clopidogrel group. Prior to this study there had been no literature looking at immediate vs delayed ICH in clopidogrel patients. Previous to this study the guideline was if the antiplatelet patient incurred a minor head injury but was neurologically intact no imaging was necessary. Of note with this study is that while there inclusion criteria was for those with head injury regardless of loss of consciousness or amnesia, 64% of the patients with ICH had a GCS of 15. 10.8% in the warfarin group and 18.2% in the clopidogrel group with ICH had no loss of consciousness, a normal mental state, and no trauma noted above the clavicles. This study did not include an analysis of those on aspirin alone.

Article 2: Incidence and Predictors of Intracranial Hemorrhage After Mild Head Injury in Patients on Anticoagulant or Antiplatelet Therapy. J Trauma. 2011;70: E1-E5. Brewer, E. et. al.

This study was a retrospective review of a trauma registry from a level II trauma center. Over a 2 year period they looked for the prevalence of intracranial hemorrhage in patients receiving a minor head injury and who were taking warfarin or clopidogrel. Minor head injury was defined as a GCS of 15 on arrival. This study included 141 patients with a mean age of 79. They did not find a statistically significant difference in clopidogrel vs warfarin. They did report an increased rate of intracranial hemorrhage in those patients that lost consciousness. Of note as well is 18% of those patients without a loss of consciousness had intracranial hemorrhage.

Article 3: Low-Dose Aspirin Prophylaxis and Risk of Intracranial Hemorrhage in Patients Older than 60 Years of Age with Mild or Moderate Head Injury: A Prospective Study. Journal of Neurosurgery. 2003 Oct; (99): 661-665. Spektor, S. et. al.

This study looked at 231 patients older than 60 who arrived to the emergency department after a minor head injury. 110 patients were receiving prophylactic low dose aspirin therapy and the remaining patients were taking no antiplatelet or anticoagulant medication. All patients underwent CT scan of the head. They found 24.5% ICH in the aspirin group and 25.6% ICH in the control group. Surgery was not required for any of these patients. They concluded that low dose aspirin therapy did not increase risk of ICH in this population.

Overall Discussion:

During group discussion we discussed the known danger and increased ICH we have seen with patients taking pradaxa and warfarin. We were somewhat surprised that the clopidogrel group had a higher rate of ICH as compared to warfarin. Additionally concern was raised that a large percentage of those with ICH presented without loss of consciousness and without sign of trauma above the clavicles. They had a normal neurologic exam and a GCS of 15.

We discussed the European model that practices admission for head injured patients on anticoagulant therapy with follow up CT in 24 hrs. The first study did look at delayed

ICH and found a rate <1% however some other studies have noted rates closer to 6%. This model of admission, observation, and repeat imaging is supported by the literature secondary to a significant amount of delayed hemorrhage; however, it is cost prohibitive. The cost of adding one year of life per patient in the US healthcare system approaches 1 million dollars.

We discussed one model that performs call backs on all head injury patients taking antiplatelet and/or anticoagulant therapy; however, our concern was for those that deteriorate and are not able to answer the telephone.

While only a few of the patients with immediate and delayed intracranial hemorrhage required surgical intervention, no predictors prior to imaging existed. Much like our chest pain patients that present with atypical symptoms, these head injury patients require a workup prior to determining which ones require intervention. As a group we did feel greater caution is required with all minor head injury patients taking antiplatelet and anticoagulant therapy regardless of presenting mechanism, history, signs, and symptoms.

The majority of minor head injury patients are taking antiplatelet and/or anticoagulant therapy and arrive to the ED after only minor head injury. Our conclusion was that reassurance does not exist in clinical presentation and that regardless of therapy great caution should be taken to suspect ICH and monitor these patients for such an event. We conclude that CT imaging is a required modality regardless of mechanism, severity, therapy, or presentation.