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Failure to diagnose concussion/TBI due to a lack of understanding of the mechanism of injury

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Statement of the Problem: Since the National Football League concussion settlement, diagnosing concussions in sports has become a priority. With rule changes the following season more concussions were diagnosed not because of an increased prevalence but due to a better understanding of the condition. CDC records go a step further to show a greater prevalence of concussions in motor vehicle collisions. As scientists we are limited by what we can measure. Understanding what to measure will open the doors to a better understanding of concussion/TBI.

Literature Review: Most current research addresses repetitive injuries commonly seen with athletes. Michael Freeman's 2010 study on traumatic cerebellar tonsillar extopia in whiplash[1], points to the need for further research on brain injuries in motor vehicle collisions. Most recently a long term study of veterans has demonstrated that the risk of dementia doubles with a single concussion without loss of consciousness.[2] Others have found that with a lack of understanding of the conditions there is also a lack of follow up care.[3] Researches like Josef Rauschecker have taken up the gauntlet to examine somato-sensory aberrations.[4]

Conclusion & Significance: With a focus on cerebral lesions we miss so many structures that are exposed to trauma. With a better understanding of the mechanism of injury comes a better understanding of what can be injured. The current attitude of shaking it off and getting back in the game needs to be replaced with an understanding of the prevalence and extent of these injuries.

Recent Publications:

1. Freeman, M; Rosa, S; Harshfield, D; et al, (2010). A case-control study of cerebellar tonsillar ectopia (Chiari) and head/neck trauma (whiplash). Brain injury : [BI]. 24. 988-94. 10.3109/02699052.2010.490512.
2. Barnes,D;, ,Byers, AL PhD; et al; Association of Mild Traumatic Brain Injury With and Without Loss of Consciousness With Dementia in US Military Veterans, JAMA Neurol. 2018;75(9):1055-1061.
3. Seabury, SA; Gaudette,, E; Goldman, D; Assessment of Follow-up Care After Emergency Department Presentation for Mild Traumatic Brain Injury and Concussion Results From the TRACK-TBI Study JAMA Network Open 2018; 1(1); e 180210
4. Rauschecker JP, Where, When, and How: Are they all sensorimotor? Towards a unified view of the dorsal pathway in vision and audition. 10.1016/j.cortex.2017. 10.020. Epub 2017 Nov 3.
5. Masel BE, DeWitt DS. Traumatic brain injury: a disease process, not an event. J Neurotrauma. 2010 Aug;27(8):1529-40.
6. Cusimano, MD; Casey, J; Jing, R, et al, Assessment of Head Collision Events During the 2014 FIFA World Cup Tournament, JAMA. 2017;317(24):2548-2549.

Biography

William P Gallagher Jr with Lois Laynee has created the Concussion Recovery Center and the Concussion Testing Center. Together they provide testing to validate all injuries with a concussion and provide therapies to retrain the brain and cranial nerves Together with chiropractors who have graduated from the American Academy of Motor Vehicle Injuries who see a minimum of 500 new cases each month they are involved in research on concussions/TBI.

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