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Concussion: What's the State of Play for Children & Adolescents in 2017? Brief Report

Wstrząśnienie: Jak wygląda sytuacja w przypadku dzieci i nastolatków w 2017 roku? Krótki raport

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Abstract

Every country around the world enjoys sport. Australia is widely known for cricket and rugby; America is known for baseball & gridiron football, Europe for soccer, amongst others. These sports are played at an elite level as well as beginners from an early age in the backyard. Yet it is also these sports that can deliver a ball at the speed of 100 km/hr (football), 105 km/hr (baseball), 112 km/hr (rugby), 150 km/hr (cricket) and 211 km/hr (soccer). This is the same force that can occur in a motor vehicle accident. The force finds the target, often accidentally, the head. Damage to the brain is not only from the impact of the ball hitting its target, but also the shearing forces of an acceleration-deceleration in jury — often resulting in a concussion. But you can't see a concussion and this is what makes diagnosis and treatment difficult. Children and adolescents are particularly at risk as their brains are growing, requiring support and protection. (JNNN 2017;6(1):26–27)

Key Words: concussion, children, adolescents

Streszczenie

Sport cieszy się popularnością we wszystkich krajach na całym świecie. Australia słynie z gry w krykieta oraz rugby; Ameryka z baseballu oraz futbolu amerykańskiego, a Europa m.in. z gry w piłkę nożną. Powyższe dyscypliny uprawiane są zarówno na poziomie profesjonalnym, jak również na podwórkach przez młodzież na poziomie początkującym. Jednak to właśnie w tych dyscyplinach piłka może osiągać prędkość 100 km/godz. (futbol amerykański), 105 km/godz. (baseball), 112 km/godz. (rugby), 150 km/godz. (krykieta) i 211 km/godz. (piłka nożna). Jest to ta sama siła, która może wystąpić w przypadku wypadku samochodowego. Przypadkowym celem działania takiej siły może być głowa. Uszkodzenie mózgu jest nie tylko wynikiem trafienia piłką w cel, ale także urazu powstałego w wyniku działania sił ścinających przyspieszenia-hamowania — częstym wynikiem czego jest wstrząśnienie mózgu. Wstrząśnienie mózgu jest niewidoczne, co powoduje trudności w jego zidentyfikowaniu oraz leczeniu. Dzieci i młodzież są grupą szczególnie narażoną na ryzyko, ponieważ ich mózg rośnie i wymaga wsparcia oraz ochrony. (PNN 2017;6(1):26–27)

Słowa kluczowe: wstrząśnienie, dzieci, młodzież

Brief Report

Concussion is defined by the Zurich consensus statement [2,3,6], as “a complex patho physiological process affecting the brain, induced by traumatic biomechanical forces”. It is a functional injury that should resolve over time rather than a structural brain injury. In most cases of sports related concussion, the symptoms resolve spontaneously within 10–14 days [8]. In some however, complications occur and recovery can

take longer [4]. Other features include a brief period of retrograde amnesia (impaired recall of events just prior to the injury) and post traumatic amnesia (impaired recall for the time between the injury or resumption of consciousness and the point at which new memories are stored and retrieved). In order to make the diagnosis of concussion, the clinical history and mechanism of injury needs to be known.

The evaluation and management of acute concussion differs in young children [7]. There is evidence that teens

take longer to recover after a concussive injury than adults and that return to play on the day of the injury leads to subsequent cognitive decline [9,10]. Diffuse cerebral oedema is another concern especially in adolescents. Therefore children/teens under 18 yrs. of age with concussion, require a more conservative approach regardless of their level of competition [9,10]. Schools are advised to have guidelines and a plan of care for sports-related concussions as a growing brain needs nurturing. Neuroscience nurses are at the forefront of educating school children, parents, coaches and teachers through partnering with local schools. It is important firstly to recognize that a scenario for a concussion has occurred (a head knock) and to remove that person from play for assessment. The priority for care of the child with concussion is to manage the symptoms and return to school prior to considering return to play [1,5,7,9]. The child will need medical clearance and usually will only need 1–2 days off school. However, others may require longer rest periods. The child may return to school once symptom-free, that is when the symptoms are no longer exacerbated by reading or using the computer at home [10]. However, there are times that a more thorough return to school plan will need to be developed that includes shorter school days, longer time to complete assignments, repeating instructions and frequent breaks. Only after successful return to school without worsening of symptoms, may the child be allowed to commence a graded return to sport [9].

Summary

Sports related concussion is a functional disturbance rather than a structural injury to the brain. Although most individuals recover well after a concussion, complications can occur, particularly in children/adolescents with premature return to sport. The key components of safe return-to-play decisions include rest periods until all symptoms have resolved and then a graded program of exertion before return to sport. For some, neuropsychological testing and a multidisciplinary approach to management should be considered to ensure objective recovery of cognitive function. Education of school students, parents, schoolteachers and coaches is a priority for neuroscience nurses and successful partnerships with local schools is encouraged.

Resources

- SCAT3. Available at bjsm.bmj.com/content/47/15/259.full.pdf
- Child SCAT3. Available at bjsm.bmj.com/content/47/15/263.full.pdf

References

- [1] Makdissi M., McCrory P., Ugoni A., Darby D., Brukner P. A prospective study of postconcussive outcomes after return to play in Australian football. *Am J Sports Med.* 2009;37(5):877–883.
- [2] McCrory P., Meeuwisse W., Johnston K. et al. Consensus Statement on Concussion in Sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008. *Br J Sports Med.* 2009;43(Suppl. 1): i76–90.
- [3] McCrory P., Meeuwisse W.H., Aubry M. et al. Consensus statement on concussion in sport: the 4th International Conference on Concussion in Sport held in Zurich, November 2012. *Br J Sports Med.* 2013;47(5):250–258.
- [4] Omalu B.I., Bailes J., Hammers J.L., Fitzsimmons R.P. Chronic traumatic encephalopathy, suicides and parasuicides in professional American athletes: the role of the forensic pathologist. *Am J Forensic Med Pathol.* 2010;31(2):130–132.
- [5] Davis G.A., Purcell L.K. The evaluation and management of acute concussion differs in young children. *Br J Sports Med.* 2014;48(2):98–101.
- [6] Makdissi M., Darby D., Maruff P., Ugoni A., Brukner P., McCrory P.R. Natural history of concussion in sport: markers of severity and implications for management. *Am J Sports Med.* 2010;38(3):464–471.
- [7] Davis G.A., Purcell L.K. The evaluation and management of acute concussion differs in young children. *Br J Sports Med.* 2014;48(2):98–101.
- [8] Makdissi M., Davis G., McCrory P. Updated guidelines for the management of sports-related concussion in general practice. *Aust Fam Physician.* 2014;43(3):94–99.
- [9] Wiler B. *5th International Consensus Conference on Concussion, Berlin as discussed at Brain Injury Australia NSW Concussion Workshop November 7, Sydney Australia* 2016.
- [10] Browne G.J., Dimou S. Concussive head injury in children and adolescents. *Aust Fam Physician.* 2016;45(7):470–476.

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