Paediatric sport related concussion pilot study

A study was undertaken to determine the degree to which paediatric neurosurgeons agreed on the optimum management of sport related concussion in children. A paradigm for management of concussion in children has not been defined, and the management of such patients largely relies on expert advice from neurosurgeons. This pilot study aimed to establish current consensus neurosurgical practice for management of children with sport related concussion.

Methods

For the purposes of this study, we defined sport related concussion as a head injury occurring during sport (or play) participation in children 5–15 years of age with an admission Glasgow coma score of 15 and a normal neurological examination. A standardised questionnaire was sent to 20 neurosurgeons throughout Australia identified as having specific expertise in paediatric neurosurgery. There were three parts to the questionnaire. The first related to the routine management of uncomplicated sport related concussion in children. The second involved the role of follow up neuroimaging, neuropsychology, protective equipment recommendations, and return to school advice. The third examined the degree of importance placed on a number of clinical prognostic indicators by the neurosurgeons.

Results

Thirteen paediatric neurosurgeons responded to the study (65% response rate). Only three respondents said that they would routinely use skull radiographs and two would routinely use computed tomography scans in uncomplicated sport related concussion. The respondents varied in their methods of dealing with concussed patients, with some recommending hospital admission, some discharging the patient home with the parents, and others recommending a period of observation in the emergency department.

There was a complete lack of consensus among the respondents about the need for follow up, and, if it was thought to be necessary, the length varied from one to six weeks. None of the respondents stated that they would routinely perform neuroimaging or neuropsychological testing at follow up. The results were similar for return to school and return to sport time frames, with ranges of one to six weeks.

Six of the 13 respondents would routinely advise the use of a helmet, and three of the 13 would recommend the use of a mouthguard after such injuries. The following symptoms and signs were examined: headache, vomiting, scalp haematoma, scalp laceration, loss of consciousness, pallor, dry tongue, tiredness or sleepiness, irritability or restlessness, refusal to eat, abusive or aggressive behaviour, withdrawn behaviour, amnesia, and parental concern.

There was no consensus on which of these symptoms or signs are of prognostic importance.

Discussion

In children aged 15 years and under, traumatic brain injury is a common cause of presentation to emergency departments and general practitioners. In the United States, it has been estimated that more than 1 million children sustain a traumatic brain injury annually (of which 85% are mild injuries), and that such injuries account for more than 250,000 paediatric hospital admissions as well as more than 10% of all visits to emergency services.1 Neurosurgeons are often asked to provide expert opinion on the management of such patients.

Following the First International Conference on Concussion in Sport in Vienna 2001, guidelines were drafted on the management of sport concussion in sport.2 The scientific data upon which these recommendations were based relate specifically to adults and not to children. The American Academy of Paediatrics published guidelines on the management of mild closed head injury in children in 1999; however, these guidelines were more concerned with predicting which children would subsequently develop intracranial complications than the issues of return to sport and neuropsychological recovery.3 The American Academy of Paediatrics guidelines state that there is no indication for routine use of skull radiograph in paediatric concussion and “no data are available that demonstrate that children who undergo CT scanning early after minor closed head injury with loss of consciousness have different outcomes compared with children who receive observation alone after injury.”4

It is not surprising given the paucity of literature on this subject that considerable differences exist, even among experts, as to the management of sport related concussion in children. This has a number of important implications over and above the acute management of the injury, given the potential for concussive injuries to have detrimental effects on the child’s development and scholarly performance. After this pilot study, we plan to undertake a larger study of the neurological and neuropsychological management of children with sport related concussion.

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doi: 10.1136/bjsm.2004.015958

Competing interests: none declared

References


In the preface, the author writes “Indeed, the avoidance of too much detail and too many theories is a prime objective”. I feel that this aim prevents the book from becoming a required text for either students or practitioners of epidemiological research, as the author’s writing style is engaging and very easy to follow. As a result, I struggle to find the information provided.

As in (almost) all textbooks, especially first editions, there are a small number of errors. For example, on page 40 it states that “… the sample mean is 82.696, there is a 95% probability that the population mean lies between 80.509 and 84.883.”. In fact, the probability that the population mean lies between these two limits is 0 (zero) or 1 (one). To my mind, this is the only error worth noting, and I am impressed that the author has touched on such a large range of topics, albeit briefly, and been accurate in all the information provided.

In conclusion, I leave you with a summary that is possibly difficult to understand. I find it difficult to define an audience to whom I would recommend this text while, at the same time, I look forward to seeing a more thorough treatment of the topic by this author.

Key subjects to be covered include: diagnostic radiology; ultrasound; nuclear medicine; interventional radiology; veterinary radiology; emerging technologies; image analysis; computer applications; PACS; radiobiology; radiological physics; management & audit; computed tomography; magnetic resonance; equipment development.

Expected attendance (conference and exhibition): 4000

Further details: UKRC 2005 Organisers, PO Box 2895, London W1A 5RS, UK; Website: www.ukrc.org.uk; Fax: +44 (0)20 7307 1414; Conference tel: +44 (0)20 7307 1410, Email: conference@ukrc.org.uk; Exhibition tel: +44 (0)20 7307 1420, Email: exhibition@ukrc.org.uk

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Further details: Oslo Sports Trauma Research Centre and Department of Sports Medicine, University of Sport and Physical Education, Sognsveien 220, 0806 Oslo, Norway. Email: 2005congress@nih.no; website: www.ostrc.no

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Abstract submission deadline: 31 March 2005

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13–15 October 2005, Lemesos, Cyprus

Further details: Email: pyrgos.com@cytanet.com.cy

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10–12 November 2005, Edinburgh, Scotland

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doi: 10.1136/bjsm.2004.015958

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