

South African rugby guidelines on the management of concussion

Introduction

Concussion is a significant problem in South African rugby and cause for concern. With an increasing number of participants coupled with increasing competition at all levels of the game, concussion is a critical issue that requires attention if serious injury, disability and death are to be prevented.

Definition

Definitions of concussion abound and vary widely. A good working definition of concussion is that it is 'a clinical syndrome characterised by immediate and transient post traumatic impairment of neural function, such as alteration of consciousness, disturbance of vision and/or equilibrium due to cerebral or brain stem involvement'.

Mechanism of injury

Concussion may be sustained through a variety of mechanisms, including:

- A direct blow to the head
- A blow to the jaw
- Sudden twisting or shearing force on the head
- Sudden deceleration of the head.

It is important to bear in mind that it is not necessary for a player suffering concussion to fall to the ground. Also important is the fact that loss of consciousness is not a necessary sign of concussion, but may indicate its severity.

Pathophysiology

There has been much speculation, but the exact pathophysiology of concussion is unknown. Also debatable is whether concussion is a unitary phenomenon or whether several subtypes occur resulting in varying clinical manifestations.

Concussion is typically associated with normal neuroimaging studies, e.g. X-rays, MRI and CT scans. While no gross structural changes are found, functional deficits are common. Also important is that during this period the brain is vulnerable to further damage, although the exact length of this period is unknown.

Preventive measures

There is strong opinion that employing preventive measures can reduce the risk of concussion. These include:

- Strict application of the rules of the game
- Neck strengthening
- Use of properly fitting mouth-guards.

Symptoms

Symptoms and signs of concussion vary widely. Common among these are:

Cognitive features

- Unaware of the period, opposition, score of the game
- Confusion
- Amnesia
- Unaware of time, date, place.

Typical symptoms

- Headache
- Dizziness
- Giddiness
- Nausea
- Unsteadiness/loss of balance
- Feeling stunned or dazed
- Seeing stars or flashing lights
- Ringing in the ears
- Loss of field of vision
- Double vision
- Sleepiness, sleep disturbance
- Feeling slowed down
- Fatigue

Physical signs

- Loss of consciousness/impaired conscious states
- Poor co-ordination and balance
- Seizure
- Slowness in processing information, e.g. answering questions or following directions
- Easily distracted or poor concentration
- Inappropriate emotions, such as laughing or crying
- Nausea or vomiting
- Vacant stare/glassy eyed
- Slurred speech
- Personality changes
- Inappropriate behaviour, e.g. running in the wrong direction
- Significantly decreased playing ability

Management

General principles

- A player does not need to have lost consciousness to have had a concussion!

- If any of the above symptoms or problems is present, a head injury should be suspected and appropriate management provided.
- Where a head injury is suspected, the patient management must assume a neck injury unless evidence points to the contrary.
- Always err on the side of caution. 'If in doubt, sit it out!'

Acute response

When a player shows ANY symptoms or signs of a concussion:

- The player should not be allowed to return to play in the current game or practice. This should be adhered to however mild the concussion, and includes the 'dinger'.
- The player should not be left alone; monitoring for deterioration is essential. This may require overnight admission to hospital if necessary.
- The player should be evaluated by a medical doctor.
- Return to play must be a gradual process monitored by a medical doctor.

Indications for CT/MRI scans

While CT/MRI scans are recommended in the following instances in order to determine structural abnormalities, it needs to be borne in mind that in most instances such tests would be negative.

- Prolonged loss of consciousness (> 5 minutes)
- Prolongation of symptoms
- Focal signs, e.g. paralysis or weakness of part of the body, sensory or motor deficits, etc.
- Seizure activity

Neuropsychological testing

In addition to a symptom history and good clinical evaluation, neuropsychological testing remains the cornerstone in assessing the functional deficits arising from concussion. CT/MRI scans give an indication of structural abnormalities and are far more often than not, negative. Neuropsychological testing is an objective test and would override a player's underrating of his symptoms in order to return to play. Additionally symptoms are variable and may resolve before cognitive deficits have resolved.

Neuropsychological tests include the measurement of the following parameters:

- Memory
- Information processing
- Planning
- Switching mental set.

There is a range of forms of such tests available. These include:

- Paper and pencil tests, including shortened versions of such tests
- Comprehensive protocols administered by neuropsychologists
- Computerised tests.

Important in all of these tests is a baseline test, because of the normal variance. However even in the absence of such a baseline test the neuropsychological assessment is still valuable. Wherever possible baseline tests should be performed. Serial testing should be performed post-injury.

The advantage of paper and pencil tests is that they can be performed at the stadium and do not require sophisticated equipment. They can also be scored immediately.

Computer-based tests have the advantage of being more sensitive and can pick up deficits such as delayed response, which paper and pencil tests cannot.

For associations without the necessary resources and facilities we recommend the paper and pencil tests, in particular the McGill Abbreviated Concussion Evaluation (ACE). We recommend that the team doctor familiarises him/herself with the questionnaire and scoring system.

Wherever possible a computer-based program is recommended. The programs recommended are IMPACT and CogSport. All players contracted to SA Rugby will use the CogSport programme.

Steps to return to play

The International Rugby Board (IRB) currently recommends that a player who suffers concussion must not play rugby for a period of 3 weeks. This must be strictly enforced in Age Grade Rugby.

Such recommendations are set on the period a player should be out of the game in the event of a concussion. This period is in some protocols based on the severity of the concussion. More recent recommendations utilise objective findings — viz. symptoms, signs and neuropsychological testing — in determining return to play. The more severe the concussion the greater the symptomatic period and thus such a player would return to play later than one with a mild concussion. Thus function-based recommendations have replaced recommendations based on abstraction.

We recommend that the IRB mandatory period of abstinence be combined with the function-based system discuss hereunder.

Return to play while symptomatic has many consequences, not least of which is the 'second impact syndrome'. This rare condition is usually fatal because a seemingly mild blow to the previously concussed head may result in massive brain swelling. As a result of the concussion the player's performance will inevitably be suboptimal defeating the objective of rapidly returning the player back to competition.

Prior to starting this programme, the player must be completely asymptomatic and have normal neurological and cognitive evaluation.

Return to play must follow a number of steps, given below. Each step will take a minimum of one day. If asymptomatic proceed to the next level. If symptomatic then drop back to a level where there are no symptoms and attempt progression again after 24 hours.

1. No activity, complete rest.
2. Light exercise such as walking or stationary cycling.
3. Jogging to running.
4. On field practice without body contact.

5. On field practice with body contact, once cleared by the doctor. (Time required to progress from non-contact to contact will vary with the severity of concussion).

6. Game play.

Long-term management

It has been recommended that should a player suffer two concussions in a season he should not play for the rest of the season. This has been taken further and it has been recommended that a player who suffers three concussions should be excluded from contact or collision sport permanently.

It is important to note that while these recommendations use the precautionary principle, they are not evidence based. There is also no evidence to support the contention that sustaining several concussions over a sporting career will necessarily result in permanent damage. Importantly as well is that should these recommendations be implemented, it would mean the end of a professional player's career. The player in this instance may institute a legal challenge to this decision. It would therefore be prudent to utilise good clinical judgement and common sense, in the absence of scientifically valid guidelines.

The use of symptoms and clinical signs in addition to cognitive function would be the most useful tools to use in determining return to play.

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Dr Ismail Jakoet
Medical Consultant
SA Rugby

For: SA Rugby Scientific and Research Committee
