Common sports injuries and their management

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Abstract

Regular participation in sport and exercise can also have a detrimental effect on health in the form of injury. The effects that sport and exercise related injuries have on an individual’s health can be relatively minor, with a period of rest needed, or more profound resulting in athletes having to retire from their careers. Sport and exercise related injuries do not just effect elite performers, but are a significant problem at every level of participation. Around a third of all emergency consultations are directly linked to sport and exercise. Although participation in any form of activity carries a risk of injury the overall health benefit of activity far outweighs this risk. This paper examines the process of classification of sporting injuries. It then focuses on the assessment and management strategies that are appropriate for different types of sporting injuries based on their initial classification.

Keywords: Sports Injuries, Detrimental Effect, Management, Common Causes, Prevention

1 Introduction

The term sports injury, in the broadest sense, refers to the kinds of injuries that most commonly occur during sports or exercise. Some sports injuries result from accidents; others are due to poor training practices, improper equipment, lack of conditioning, or insufficient warm-up and stretching. Although virtually any part of your body can be injured during sports or exercise, the term is usually reserved for injuries that involve the musculoskeletal system, which includes the muscles, bones, and associated tissues like cartilage. Fortunately, most sports injuries can be treated effectively, and most people who suffer injuries can return to a satisfying level of physical activity after an injury. Even better, many sports injuries can be prevented if people take the proper precautions. In almost all the sports, injuries are involved. It is the responsibility of the P.E.T.s. to recognize the injuries and at least they should be able to give preliminary treatment before the Doctors or specialist. Sport injuries are diverse in terms of the mechanism of injury, how they present in individuals, and how the injury should be managed. Defining exactly what a sports injury is can be problematic and definitions are not consistent. In this paper a sports injury is defined as any damage to tissues as a direct result of participating in sport and exercise, which causes the frequency and/or intensity of participation to be changed or ceased? This definition includes minor sports injuries that may not receive medical treatment in addition to more severe injuries that do require medical attention. All sports injuries can be sustained in a normal active lifestyle. For example, a grade II sprain of the ankle can be sustained as a result of a poor tackle in soccer, or by stumbling on a poorly maintained footpath whilst out walking. To be able to effectively diagnose, rehabilitate, and ultimately prevent subsequent injury a sports therapist should understand the aetiology of the sports injury. Identifying the exact cause of an injury can represent a significant challenge to a sports therapist as the aetiology of the injury is not always obvious.
Another challenge to a sports therapist is that the same injury sustained in two different individuals could have completely different aetiology. For example ITB syndrome could be caused by inappropriate footwear for participation, excessive downhill running, or a leg length discrepancy. Finding the cause of a sport injury requires you to have detailed understanding about the physical demands of the sport/exercise, the psychological demands of the sport/exercise, the appropriate equipment that should be used, the surface of competition and/or training, the individual’s training: frequency, intensity, duration, and type.

2 Ways to classify sports injuries

Sports or performance injuries can be classified according to either the cause of the injury or the type of body tissue damaged. If injuries are classified according to cause, the three categories are direct injury, indirect injury and overuse injury. If injuries are classified according to the type of body tissue damaged, the two categories are soft-tissue injury and hard-tissue injury.

2(a) Direct injury

A direct injury is caused by an external blow or force. Direct injuries can be caused by a collision with another person (for example, during a tackle in rugby union) being struck with an object (for example, a cricket ball or hockey stick). Examples of injuries that result from external forces include hematomas (‘corks’) and bruises, joint and ligament damage, dislocations and bone fractures.

2(b) Indirect injury

An indirect injury can occur in two ways:

• The actual injury can occur some distance from the impact site. For example, falling on an outstretched hand can result in a dislocated shoulder.

• The injury does not result from physical contact with an object or person, but from internal forces built up by the actions of the performer, such as may be caused by over-stretching, poor technique, fatigue and lack of fitness. Ligament sprains and muscle strains and tears are examples of these injuries.

2(c) Overuse injury

Overuse injuries occur when excessive and repetitive force is placed on the bones and other connective tissues of the body. Little or no pain might be experienced in the early stages of these injuries and the athlete might continue to place pressure on the injured site. This prevents the site being given the necessary time to heal. Eventually the damage accumulates, and the injured site becomes inflamed, and therefore painful. The symptoms of overuse injury often occur when there is a change in training practices (such as increasing training frequency or intensity), and the body is unable to deal with the new stresses that are placed upon it. A large number of overuse injuries results from poorly planned training programs in which the athlete is not given appropriate time to recover between intense sessions.

Dr. Satish Bhardwaj: Common sports injuries and their management
### Table 1: Overuse Injuries

<table>
<thead>
<tr>
<th>Injury</th>
<th>Symptoms and signs</th>
<th>Possible causes</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shin soreness</td>
<td>Tenderness Pain in shins</td>
<td>Increased activity</td>
<td>Decrease painful activity</td>
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<tr>
<td></td>
<td>Pain increases by running and jumping</td>
<td>Poor footwear</td>
<td>Physiotherapy</td>
</tr>
<tr>
<td></td>
<td>Swelling</td>
<td>Postural imbalance</td>
<td>Correct footwear</td>
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<td></td>
<td></td>
<td>Muscle imbalance</td>
<td>Orthotic control</td>
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<tr>
<td>Knee pain</td>
<td>Pain around knee</td>
<td>Increased activity</td>
<td>Decrease activity</td>
</tr>
<tr>
<td></td>
<td>Pain increased by sport, stairs, sitting, hills</td>
<td>Postural imbalance</td>
<td>RICER</td>
</tr>
<tr>
<td></td>
<td>Swelling</td>
<td>Poor footwear</td>
<td>Physiotherapy</td>
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<tr>
<td></td>
<td>Discolouration</td>
<td>Muscle imbalance</td>
<td>Tape</td>
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<tr>
<td></td>
<td></td>
<td>Growth spurt</td>
<td>Correct footwear</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Orthotic control</td>
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<tr>
<td>Heel pain</td>
<td>Tenderness over heel</td>
<td>Tight calf muscles</td>
<td>Decrease activity</td>
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<tr>
<td></td>
<td>Pain increased by running, jumping</td>
<td>Growth spurt</td>
<td>RICER</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poor footwear</td>
<td>Physiotherapy</td>
</tr>
<tr>
<td>Shoulder pain</td>
<td>Pain on certain movements</td>
<td>Increased activity, e.g. swimming</td>
<td>Decrease activity</td>
</tr>
<tr>
<td></td>
<td>Reduced movement</td>
<td>Poor technique, e.g. swimming, pitching, serving</td>
<td>RICER</td>
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<tr>
<td></td>
<td>Local tenderness</td>
<td></td>
<td>Physiotherapy</td>
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<tr>
<td></td>
<td></td>
<td>Stretching program</td>
<td>Correct footwear</td>
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<td></td>
<td></td>
<td></td>
<td>Orthotic control</td>
</tr>
<tr>
<td>Elbow pain</td>
<td>Pain in and around elbow</td>
<td>Increased activity, e.g. golf, tennis</td>
<td>Decrease activity</td>
</tr>
<tr>
<td></td>
<td>Pain increased by certain activities, e.g. shaking, lifting, gripping jarring</td>
<td>Muscle imbalance</td>
<td>RICER</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poor technique</td>
<td>Physiotherapy</td>
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<tr>
<td></td>
<td></td>
<td>Change of grip</td>
<td>Stretching program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of control</td>
<td>Elbow brace</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Modify technique</td>
</tr>
</tbody>
</table>

Other causes of overuse injury are use of poor technique and poor equipment. Athletes who practice and compete using poor technique or equipment place extra stress on their body. Examples of this include elbow injury from poor backhand technique or the use of a heavy racquet in tennis, and ankle or knee pain from an inappropriate running style or from wearing inappropriate footwear. Examples

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of injuries that result from repetitive forces are stress fractures (small cracks in the bone) and tendonitis (inflammation of a tendon).

3 Key extrinsic causes of sports injury

3(a) Training-related factors

These factors relate to the design of the training programmes. Excessive repetitive loading of the tissues is needed for successful adaptation, however, without suitable recovery tissues never have the chance to adapt and can fail. Sudden increases in frequency, intensity and duration, or simply changing training method can go beyond the tissues fail tolerance level leading to increased risk of injury. Performing sport and exercise specific techniques poorly can place excessive strain on tissues. For example, poor shot technique in tennis increases the risk of tennis elbow.

3(b) Equipment selection factors

These factors relate to the suitability of equipment in training and competition. Incorrect footwear will not protect the foot and ankle adequately nor distribute forces effectively leading to an increased risk of injury. Not adhering to the personal protective equipment rules places individuals under increased risk of injury. Training or competing with equipment that is not the correct size or weight can make movements biomechanically inefficient and place greater strain on joints, connective tissues, and muscles.

3(c) Environmental factors

These factors include the environmental temperature and the surface that participation takes place on. Training on surfaces that are too hard or too soft can lead to excessive forces going through the body or lead to a greater risk of sprains because feet/legs can become stuck in wet turf. Uneven surfaces, such as cambered paths or roads, can lead to increased force being placed through one side of the body.

3(d) Psychological factors

Psychological factors relate to the psychological demands of training/competition and how individuals respond to these demands. Being over or under-aroused can lead to becoming injured by making poor decisions. It is not uncommon for individuals to become over assertive or aggressive when competing which can lead to them harming themselves or others. For a more in-depth discussion of the psychological determinants of injury.

3(e) Nutritional factors

These factors mainly encompass ensuring the athlete has adequate glycogen stores, hydration and protein intake. Having adequate glycogen stores increases the time taken to become fatigued. Correct hydration reduces the effect of dehydration, prevents hypernatremia, and overheating of the body. Without correct protein intake, an individual’s soft tissue may not recover or adapt properly, and can lead to DOMS and overtraining syndrome. More often than not sports injury is a result of a number of
inter-related factors. Intrinsic factors can lead to a predisposition to sports injury that when combined with exposure to extrinsic factors lead to sports injury.

![Injury aetiology and mechanism model demonstrating how intrinsic and extrinsic risk factors contribute to sports injury](image)

**4 Most common injuries in the sports**

**4(a) Skin injuries:**

- **Blister:** These types of injuries are observed mostly in early stages of athletics training. Blister mostly occurs on the palms of the hands and sole of the foot. The treatment to blister is to relieve soreness and prevent infection. This can be accomplished by opening the blister from one side with the help of sterilized injection needle and fluid is evacuated. Swabbing the inside of the blister with some antiseptic and applying compression dressing will hoop to recover the blister. Care must be taken that blister does not develop any infection.

- **Abrasion:** Often protective surface of the skin broken as a fall on a rough surface sometime foreign substances are rubbed in. All the abrasions should be cleaned with soap and water. Foreign substances should be picked out and then should be coated with the tincer or bengion. Deeper abrasion should be bandaged.

- **Contusion:** The contusion is caused by the hammering of some solid object against bones. Sometime turner like formation is observed, care contusion may be treated with message of ice to limit its size. Bleeding tendency of an athlete may be obtained. The larger superficial Contution require pressure bandage for 24 hours following the initial application of ice.

- **Puncture Wounds:**

  Puncture wounds are caused by pricking of needle or sharp nail etc. Puncture wounds must be seriously handled. Tetanus protection is must. The wound should be soaked with Epson salt solution four timed daily. All These wounds manifest a considerable inflammation and one should not wait to start treatment until). Frank infection is present. If mouth is closed, it should be opened and sterilized with antiseptic location. For deep puncture in the sole, a complete rest at least for four weeks is necessary.

- **Laceration:** Laceration is caused by sharp-edged object. These types of wounds should be cleaned with antiseptic Lotion and sutured at the earliest possible. Application of ice after...
suture will relieve swelling and pain. Extensive and deep, laceration should be given compression dressing. Laceration would must be explored to its bottoms All players with lacerations should receive tetanus prophylaxis. Dr. may suggest oral administration of antibiotics like septran etc.

4(b) Injuries to the muscles, fibers tendons, Ligaments and joints

- **Deep Contusion**: This type of contusion often affects muscles. Immediate treatment is cold compress and rest. The site of injury may be given sponge & rubber bandage. Large hematoma may be evacuated by surgery and arrangements may be made for continued drainage, and light compression is maintained until the wound is healed. Thereafter proper rehabilitation methods may be followed once healing has taken place.
- **Strains**: Sometimes those may be known as pulls as a result of sometimes sudden excessive uni-coordinated or unopposed muscle contraction. Chorionic strain may develop in a muscle or Tendon as a result of repeated violent motion which creates an unnatural stress. The primary treatment is rest supplemented by injection of hydrocortisone X-Ray therapy provides quick relief. Repeated muscle strain is caused due to inadequate rest.
- **Sprain**: Sprain causes damage to a greater degree to ligaments, joints capsule synovial membrane and cartilage. Immediate treatment is cold compression and rest. The latest trend is surgical exploration. Stitching of ligaments makes recovery faster. Cold compress may be repeated after every four hours for 36 hours. Area may be elevated to reduce pain.
- **Dislocation**: This injury can be diagnosed very easily with the help of X-Ray or comparing the area with healthy area. There is loss of movements and joint becomes stiff. There may be tenderness also on the joint. Movement to the area should be stopped and physiologist may be consulted.

4(c) Injuries to the bones

- **Green stick fracture**: There is crankiness and or bend in the bone.
- **Simple fracture**: Bone is fractured but there is no damage to the skin.
- **Compound fracture**: There is damage to the bone and skin as well.
- **Comminuted and compacted fracture**: It is splinting of bones or splinting at the sight of fracture,
- **Impacted fracture**: The telescopic ends of the bones have taken place and pierced through the skin
- **Multiple fractures**: Bone is broken more than one place.
- **Oblique fracture**: The ends extended diagonally across the bone. Bone is broken in L, shape.

4(d) The inflammatory stages

This stage lasts for three to five days. Inflammation is a local response to cell damage within a tissue and is a chain of events that helps the body to repair, re-form, or form new scar tissue. Inflammation from sports injuries can be caused by excess pressure, friction, overload, and over-stretching or impact trauma.
<table>
<thead>
<tr>
<th>Sports Injury</th>
<th>Description Likely</th>
<th>Aetiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haematoma</td>
<td>Bleeding under the skin or bruising. Can occur within muscle (intramuscular) or between the tissues (Intramuscular).</td>
<td>Most likely caused by a direct blow damaging the blood vessels in a local area.</td>
</tr>
<tr>
<td>Strain</td>
<td>Tearing of muscle fibres with pain, swelling and loss of muscle strength evident. Graded I–III based on severity of symptoms and fibres torn; Grade III is a complete tear of the muscle.</td>
<td>Muscle fibres fail to cope with the demands placed upon them. Muscle are likely to tear via overstretching, or rapid acceleration/deceleration.</td>
</tr>
<tr>
<td>Sprain</td>
<td>A partial or complete tear of a ligament with symptoms of pain, swelling, bruising, loss of function, and often an audible ‘popping sound’. They are graded I–III based on number of fibres torn; Grade III is a total rupture.</td>
<td>Usually caused by a direct trauma to a joint such as a tackle. Can be caused indirectly by twisting or falling in the absence of a blow or collision.</td>
</tr>
<tr>
<td>Dislocation</td>
<td>Partial (subluxation) or total (luxation) separation of a joint. Most commonly affects ball and socket joints. Symptoms include pain, bruising, swelling, loss of function, and deformity.</td>
<td>Caused by a direct blow or trauma which forces the joint to separate.</td>
</tr>
<tr>
<td>Concussion</td>
<td>A head injury with a temporary loss of brain function, concussion can cause a variety of physical, cognitive, and emotional symptoms.</td>
<td>Caused by a direct blow or collision to the head.</td>
</tr>
<tr>
<td>Contusions</td>
<td>Local muscle damage and bleeding with accompanying swelling and pain. Contusion to anterior thigh is known as a ‘dead leg’.</td>
<td>Usually a direct blow from an opponent or contact with equipment in collision.</td>
</tr>
<tr>
<td>Tendinopathy</td>
<td>Refers to a range of tendon injuries with associated local pain upon movement. Common sites are patella, rotator cuff, wrist flexor, and Achilles tendons.</td>
<td>Excessive repetitive use of joints such as jumping, running, and throwing.</td>
</tr>
<tr>
<td>Bursitis</td>
<td>Inflammation of the bursa, usually in shoulder, hip, and heel. Symptoms of local tenderness, pain, and swelling are common.</td>
<td>Usually associated with overuse of joints. However can be caused by trauma to a joint. Can be a common secondary injury.</td>
</tr>
<tr>
<td>Plantar</td>
<td>Fasciitis Pain, and sometimes inflammation of the plantar fascia (underside of the foot) which support the foot arch.</td>
<td>Usually caused by repetitive running-based training on hard ground, poor footwear, and poor foot biomechanics.</td>
</tr>
<tr>
<td>Stress fracture</td>
<td>A micro fracture in bone, usually tibia, leading to localised pain and tenderness.</td>
<td>Excessive overload stress caused by large impact forces or repetitive action of muscles pulling across the bone.</td>
</tr>
<tr>
<td>ITB Syndrome</td>
<td>Tightness of the ITB leading to pain which can be located from hip to lateral knee. Often made worse by running or eccentric activities such as walking down stairs.</td>
<td>Usually caused by repetitive use of quadriceps muscles without adequate rest. Other causes are the use of poor footwear on hard ground, biomechanical inefficiencies such as pronation, and hill running.</td>
</tr>
<tr>
<td>DOMS</td>
<td>Muscle soreness developing 24–48 hours after exertion. Symptoms are more severe after eccentric exercise.</td>
<td>Excessive overloading and over-reaching during training and competition.</td>
</tr>
</tbody>
</table>
5 Therapeutic Exercises

By Therapeutic exercise we mean the physical treatment given to an injured athlete for his rehabilitation. Any athlete or player has to go for complete rest for fast recovery. The length of rest depends upon the severity of the injury. There are only two types of injury suffered by athletes where absolute immobility of injured part may be required for a period as recommended by the doctor. With regard to healing of fractures and severe dislocation there is universal agreement that immobilization by external or internal fixation is required. Sometime prolonged complete immobilization threatens to use permanent loss of motion, then the use of elastic traction with intermittent passive exercise may help to prevent this complication. When the situation requires local immobilisation of the injured part, exercise should begin as soon as possible to obtain muscle strength in the adjacent parts and in the body generally.

5(a) Purpose of Exercises

- To restore a normal range of motion.
- To restore ad increase muscles strength.
- To balance the strength of antagonistic muscle group.
- To develop muscular co-ordination.
- To develop speed of motion.

5(b) Types of Exercise

Therapeutic exercise may be divided into four types:

a) Passive an assisted exercises.
b) Active exercises.
c) Resistive exercises.
d) Stretching exercises.

All these types of exercises may be used singular or combined in the rehabilitation of injured athletes. They will be introduced into treatment of any particular case in the above order. All exercises should proceed only as prescribed by the team physician. No one should undertake to give passive exercise, active exercise with resistance or stretching exercise with some previous experience in Physical Therapy.

- Passive:
  - The objective of passive exercise is to prepare an injured athlete for active exercise by maintaining the resting length of the muscles. It is also to maintain the resting length of the muscles to restore proprioceptive sensation, for giving passive exercise, the subject should be given movement without tension through as much as normal range as can be accomplished without inducing pain. This movement can be assisted by the hands of injured person himself or by the help of some other person. The movement should be slow, steady and rhythmic.

- Active Exercise:
  - Active exercise is of greatest value where muscles have been temporarily paralyzed. The type of quality of exercise should be recommended: y some expert. The therapist explains to the subject what motion is to be accomplished and where the muscle pull is felt. Then the subject proceeds to move with the therapist providing enough help to the muscle.
give an even and rhythmic quality to the movement. The number of movement is gradually increased.

- **Resistive Exercises:**
  - Resistive exercise is the act of contracting a muscle or muscle group against a given load. This load can be provided by some another individual by oneself, by a spring or by a weight. In progressive resistance exercise, the force is gradually increased. The principal objective of this form of exercise should be increased steadily and exact record of progress be compared with the unaffected side to determine the end point of treatment.

- **Stretching Exercises:**
  - Stretching exercises are variety of passive exercises. Their purpose is to restore mobility which has been lost because of fibrosis (inflammation) of soft tissues. Gentle stretching exercise which do not produce real pain are carried out slowly over a period of time will produce lasting results. Too vigorous stretch is started when local pain is still there and before active exercise will produce poor result.

6 **Prevention of the injuries**

A great deal of a sports therapist’s time is taken up with the assessment and treatment of sports injuries. However, one of the most important roles of sports therapists is preventing sports injuries. If you consider the physical, mental, social and financial harm that is caused by sustaining a sports injury, it is clear that this is extremely important. Primary preventive measures relate to reducing the occurrence of any injury within a sport/exercise. Secondary preventative measures relate to the sports therapist examining the injured athlete to work out how to reduce the risk of subsequent or secondary injuries. Any approach to preventing injury in an individual or team context should be sequential and follow the guidelines as mentioned below.

- Proper conditioning programmes (general and specific)
- Proper warming up.
- Protective equipment may be used (shoulder cap, knee cap, head gears, abdominal guards, skin splints, gloves, leg guards, tapping and bandages etc)
- Care & use of equipment.
- Standard equipment.
- Proper diet.
- Proper supervision
- Maintenance of playing areas.
- Psychological fitness
- Prevention of over training
- Proper rest and sleep.
- Prevention of in toxic drugs.
- First aid equipment.
- Proper technical and tactical training.

7 **Conclusion**

The use of facility design and the role of standards to reduce injury risks were noted carefully. Improvements in the design, quality and maintenance of facilities, including playing surfaces, would
benefit injury prevention. Future opportunities to identify and cost-effectively improve facility safety, as part of the government’s ongoing investment in all types of sports infrastructure, should be considered. The practical limitations on improving facility safety highlight the imperative of improving the use of injury risk management strategies and medical emergency planning in sport. Sports make a vital contribution to the development of healthy and active communities. If the objective of increased and sustainable participation in sport is to be achieved, injury prevention and management will need to be supported and promoted as an indispensable component of sports participation programs and strategies. This will require a strong and collaborative sports injury prevention culture at all levels of sport and within government agencies that invest in sport and community health and wellbeing.

8 References

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