

MEDICAL ASPECTS OF SPORTS INJURIES

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Dr. Ian Adams. Photo by courtesy of Mr. I. Crawford of the Yorkshire Post

ABSTRACT

The aims of medicine in sport — treatment and prevention of injury, advice of high-performance athletes, rehabilitation — and its beneficial effects are considered. The types of sporting injuries are described. Collision and contact sports tend to be characterised by injuries caused by direct or indirect trauma, while athletic injuries tend to result from a variety of factors that, instead of producing excellence as intended, produce injury. The physiological changes in a top-class sportsman may also be characteristic of disease, making diagnosis of injury difficult. The importance of the sportsman's mental attitude is stressed.

Medicine in sport is concerned with the treatment and prevention of injuries, examination of people to assess their suitability for a sport, and advice to the high-performance athlete. We must also consider the use of sport as a means of rehabilitation for example, for paraplegics and myocardial infarction patients, and the role of sport in the prevention of disease.

In Europe, especially in East Germany, sports medicine is an activity in its own right; in East Germany there are 250 doctors with a five-year postgraduate training in sports medicine, with a further 2,500 part-trained. In this country there are few, if any, who are even part-trained, but this situation is beginning to improve with clinics open in London, Cambridge, Manchester, and Bristol.

The benefits of sports medicine can be seen by looking at the relative performances of countries (with number of medals won relative to the population of the country) in the 1976 Montreal Olympics. Eastern European countries performed particularly well, the USA and Russia performed less well, and Britain managed only 29th place.

The types of sporting injury will be considered briefly. In the collision sports (rugby, American football), there are numerous stresses and strains on the players. Contact sports (soccer) give rise to slightly different injuries and problems, while non-contact sports usually give rise to injuries caused purely by overuse, and mainly of a medical nature, e.g. venous thrombosis in a sprinter.

We have analysed the incidence of injuries in 6,500 reported cases; some of the reports came from sports clinics, and the rest came from Casualty Departments. In Casualty Departments, 50% of cases are soccer injuries, 25% rugby, and the remaining 25% show a very wide spread, with very few due to track and field athletics. However, in a sports clinic the incidence of soccer injuries is lower, while rugby injuries present about as frequently as they do in a Casualty Department; there is a marked increase in the number of athletic injuries. It therefore follows that any survey of the incidence of sporting injuries will be misleading unless the source of the information is given, and this is also true of any survey of the types of injury sustained.

Most injuries are due to direct or indirect trauma. If the two major sports (i.e. soccer and rugby) are compared, it is seen that although there are seven times as many people playing soccer as playing rugby, the total number of injuries is only twice that seen in rugby; head injuries are also more likely in rugby (14% of injuries, compared with 7% in soccer), and fractures are also more common. These results highlight the differences between collision and contact sports.

Injuries in athletics are completely different, since what produces excellence in athletics may also produce injury. Excellence is a combination of factors inherent in the athlete (heredity, structure, psychology, training) and factors acting on the athlete from his environment (weather conditions, type of training surface, type of shoes). Wrong inherent factors (e.g. sway-back knees)

and wrong environmental factors (e.g. too much training on roads) can produce athletic injury.

Heredity will alter structure by, for instance, varying the proportion of slow and fast fibres in muscles. This cannot be altered and will determine the type of sport a person can do and thus, indirectly, the likely injuries. A weight lifter has the structure to lift 200 kg at once, but his very structure means he will be open to particular injuries, especially spinal injuries.

Different training schedules will also be associated with different types of injury. Training for long distance running can mean 150 miles of road work per week, leaving the athlete open to impact injuries, and injuries to the knees and Achilles tendons. By contrast, a shot-putter may be lifting 30 tonnes of weight six times per week, producing spinal injuries of a very specific type.

Injuries in sportsmen who do not train repetitively (the vast majority) will be completely different.

Marked physiological changes can be seen in today's

top-class athletes. For instance, cardiac output increases, as a result of increased stroke volume. This output may be as high as 30 to 50 l/min, and may be limited only by turbulent flow in the aortic arch. The athletic heart has other particular characteristics – bradycardia, irregular pulse, variable ECG, cardiomegaly – that are easily mistaken for disease. The ECG, with its wandering pacemaker, left ventricular hypertrophy, and inverted T-wave may lead to confusion between what is normal and abnormal. As in most areas of medicine, "normal" in sport is a spread, with some athletes being supernormal or above average. Lack of recognition of this may lead to lack of understanding of injuries.

Other physiological problems may occur, e.g. difficulty in maintaining a body temperature of 37^o, and replacement of water and electrolytes lost by sweating.

Mental approach is also important. There will always be athletes who have injuries, even permanent injuries, who win in spite of, or lose because of, their injuries; these people will have an excuse for failure. The reverse of this problem is the athlete who will not admit injury, and this emphasises the importance of attitude.

DISCUSSION

Mr. Williams: Dr. Adams, if someone comes into Casualty with chest pain, how do you tell if it is of muscular origin?

Dr. Adams: It is almost impossible. In the young patient, the odds are against him having an infarction. The difficulty really occurs with a middle-aged jogger or 20- to 25-year-old endurance athlete who has collapsed. A casualty officer must assume that any ECG changes are caused by disease.