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ATHLETES ATTENDING A SPORTS INJURY CLINIC — A REVIEW

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ABSTRACT

In a prospective study over the two years 1981-1982, there were 1186 separate sporting injuries treated at a Sports Injury Clinic. Just over 75% of patients were aged between 16 and 25 years old, while 80% were male. Football, Rugby, Running, Squash and Rowing contributed over 70% of these injuries. The commonest injuries were to the lower limb and lumbar region. In 43% of knee injuries there was strain of the collateral ligaments, while another 26% had patello-femoral pain. Short distance running was associated with an increase in shin splints, tibial stress fractures and hamstring injuries. Long distance running was associated with an increase in ankle and foot injuries. Sports Injury Clinics can benefit the injured athlete and there appears to be a need for their development in major hospitals.

Key Words: Rheumatology, Sports Injury, Sports Medicine.

INTRODUCTION

This study was undertaken to (i) assess the need for a Sports Injury Clinic, (ii) attempt to determine the benefits provided by such a clinic and (iii) discuss the epidemiology of sporting injuries.

The community interest in sporting activities is rising because of the increased availability of leisure time as well as the belief that cardiovascular risk factors can be reduced, and general health enhanced by improved fitness. With the resultant upsurge in sporting activity there has been an increase in injuries, both from acute trauma and from overuse. Sports Injury Clinics are still having difficulties justifying their existence in many hospitals (Williams, 1975; Sperryn and Williams, 1975; Galasko et al, 1982). Such a clinic can offer the injured athlete a correct diagnosis, reassurance, accurate therapy, education as to the nature of the injury, a graduated rehabilitation programme and advice on reducing

the risk of recurrence. Acute problems seen and treated within one to two days of injury recover more rapidly and with fewer long term sequelae.

An adequate understanding of the management for sporting injuries allows an early return to work and sport (Sperryn, 1977). Misdiagnosis and incorrect treatment can often delay this return and place a heavy psychological burden on the injured athlete. Most patients, fortunately, respond to a conservative rehabilitation programme through the careful co-ordination of the various treatments available by the Sports Injury Clinic doctors. To continue improving the management of sporting injuries, there must also be facilities available for training doctors, as suggested by Ryan (1982).

Robey et al (1971) discuss the continued need for epidemiological reviews to indicate the nature of injuries

sustained in each sport. Dramatic changes in injury patterns can occur with variations in the training programme or with the development of newer competition techniques (Stallard, 1980; Sperryn, 1976). There have been many reviews of single sports, such as Rowing (Stallard, 1980), Rugby Union (Weightman and Browne, 1974; Davies and Gibson, 1978), Tennis (Carroll, 1981), Badminton (Hensley and Paup, 1979), Football (Bass, 1967) and other ball games (Mathur et al, 1981). Different groups of players have also been studied, including High School (Robey et al, 1971), adolescent (Orava and Puranen, 1978) and female athletes (Orava et al, 1981). Some studies have used questionnaires of players or sporting groups to determine the incidence of injuries in particular sports (Weightman and Browne, 1974; Carroll, 1981; Hensley and Paup, 1979; Mathur et al, 1981; Weightman and Browne, 1975). This can result in over reporting of trivial injuries in a prospective survey, and the under reporting of moderate but not incapacitating injuries in a retrospective study.

As there are still relatively few Sports Injury Clinics seeing large numbers of patients, there have not been many studies (Sperryn and Williams, 1975; Newman et al, 1969; Sperryn, 1972; Grisogono, 1981) showing the type of patient, sport and injury leading to attendance at these clinics. We have reviewed the experience of one such clinic over a two year period, and hope to show that it has a useful function to perform.

PATIENTS AND METHODS

Attendances at the Sports Injury Clinic at Addenbrooke's Hospital, Cambridge have gradually been rising. Funding at present is from grants and unfortunately, the clinic can only operate on weekday mornings for the 24 weeks of University Term each year. About 60% of the patients treated are students, and the others are from the surrounding community.

The athletes seen are involved mostly in amateur competitive and recreational sport. Patients are seen on a self referral basis if the injury is less than 48 hours old and require their local general practitioner's referral for more chronic problems. Most fractures, lacerations and head injuries resulting from sport are treated acutely by the Accident Service, and are not seen by the clinic.

This is a prospective study over the two years from January 1981 to December 1982. Each patient attending the Sports Injury Clinic had a card on which the name, date of birth, address, date of initial consultation, sport during which injury occurred, nature of the injury and follow-up were recorded. Patients were assessed by a rheumatologist with full hospital facilities available, including radiology and pathology. They were treated by a full-time physiotherapist trained in sports medicine.

For each patient the initial presenting injury was recorded, and follow-up visits for the same injury were not included. Only a small number of athletes presented with a different injury during the study period, but these were then included in the figures for analysis as a separate event.

RESULTS

Over the two year period of 1981-1982 there were 1186 separate injuries recorded. In 1981 549 patients were treated and in 1982 this had increased by 16% to 637 patients treated.

There was a male predominance among the injured athletes with only 20% being female (Table I). The incidence of female sports injuries rose from 17% of the total in 1981 to 22% in 1982.

TABLE I

Sex distribution

	1981	1982	Total
Male	456	497	953
Female	93	140	233

The majority of the injured athletes were in the 16-25 year old range (Table II). Only 6% were in the 15 year old and under group while 19% were in the 26 year old and over group. There were no significant changes in the age distribution of injured athletes during the two years reviewed.

TABLE II

Age distribution

	1981	1982	Total
15 and under	32	36	68
16-25	401	493	894
26 and over	116	108	224

Five sports were associated with over 70% of the total injuries (Fig. 1). These were Association Football, Rugby Football, Running, Squash and Rowing. Tennis and Badminton were included together because of the similarity of injury patterns which occurred. Squash, despite being a racket sport, was not included with this group because of a different injury pattern and an older average age of players. There was a much higher incidence of ankle sprain, knee injuries, lumbar strain, muscle tears and achilles tendinitis found in the squash players when compared with Tennis and Badminton. The group listed as "others" included sports which contributed to several types of injury, as well as sports which often produced a particular injury, but never in

sufficient total numbers to be listed separately. The ball games, such as Basketball, Volleyball, and Netball contributed to injuries of the ankle, hand and knee. The martial arts resulted in injuries to the knee, lumbar spine, muscles and foot. Weight-lifting produced mainly lumbar spine injuries whilst javelin throwing produced elbow problems, especially medial humeral epicondylitis.

Fig. 1: Distribution of sporting injuries.

Sport	Percentage of total injuries
Football	19.4%
Rugby	16.4%
Short distance running	14.2%
Squash	9.0%
Rowing	8.3%
Long distance running	5.6%
Hockey	5.1%
Tennis/Badminton	5.0%
Cricket	2.4%
Gymnastics	2.0%
Skiing	1.0%
Others	11.6%

Lower limb injuries were the most common problems occurring in 51% of patients, whilst soft tissue injuries, such as muscular strains or subcutaneous bruising contributed to another 18.3% of the total injuries (Fig. 2). Many of the soft tissue injuries also involved the lower limbs. The most common anatomical sites injured were the knee, ankle, lumbar spine and prominent muscle masses. Knee injuries included meniscal tears, cruciate ligament tears, collateral ligament sprain, patello-femoral pain syndrome and traumatic synovitis. Infra-patellar tendinitis and Osgood Schlatter's disease were occasionally seen but classified in the "other" injury group rather than separately because of small numbers.

Muscle strains and tears affected many areas and the only group of muscles consistently injured were the

Fig. 2: Regional distribution of injuries.

Site	Percentage of total injuries
Knee	23.2%
Muscular	11.9%
Hamstring	4.0%
Ankle	11.8%
Lumbar	10.1%
Bruising	6.4%
Shoulder	5.9%
Hand/Wrist	5.6%
Foot	4.6%
Achilles Tendon	4.0%
Tibia	3.5%
Elbow	3.3%
Cervical	1.9%
Others	3.8%
Total	100.0%

hamstrings, which justified a separate listing. Lumbar injuries included muscle strain, disc lesions, crush fractures and spondylolisthesis.

Table III demonstrates the eleven most common injuries in relation to the associated sport. It can be seen that eight of these are due to Rugby and Association Football. Strain of the ligaments around the ankle and the collateral ligaments of the knee are the commonest single joint problems that occur.

TABLE III

Commonest injuries in respect to causative sport

Sport	Injury	Percentage of total
*Football	Ankle Sprain	4.6%
*Football	Collateral Lig. Sprain of knee	2.8%
Rugby	Shoulder	2.7%
*Football	Bruising	2.6%
Rugby	Ankle Sprain	2.4%
Rowing	Lumbar Strain	2.4%
Running	Muscle Strain	2.3%
*Football	Muscle Strain	2.2%
Rugby	Bruising	2.1%
Rowing	Wrist Tendinitis	2.0%
Rugby	Collateral Lig. Sprain of knee	2.0%

*"Football" implies Association Football throughout these tables and figures.

Shoulder injuries included a wide variety of problems, including acromio-clavicular joint subluxation, sub-acromial bursitis, supraspinatus tendinitis, rotator cuff lesions and recurrent dislocation. Of all the shoulder injuries treated, 46% occurred in Rugby. Wrist tendinitis involved mainly the extensor tendons and of the total treated 83% were in oarsmen.

Knee problems, excluding infra-patellar tendinitis and Osgood Schlatter's disease occurred in 275 patients (Table IV). Cruciate injuries were only documented alone in 6% of cases, but often occurred in association with meniscal injuries. Patello-femoral pain occurred in 26% of patients but was usually managed with conservative therapy rather than surgery.

TABLE IV

Knee injuries

	Percentage of total
Collateral Ligament	43%
Patello Femoral	26%
Meniscus	18%
Traumatic Synovitis	7%
Cruciate	6%

Long and short distance running appeared to cause different injuries as demonstrated in Table V. In short distance running there were more injuries to the hamstring muscles and tibia. In long distance running there appeared to be more chance of ankle sprains and foot problems. Because of training programmes, it is often difficult to define long and short distance running. For this study, the long distance group included orienteering, marathon and cross-country runners. The short distance group included most other track athletes, not only sprinters.

TABLE V

Running injuries

	Short Distance	Long Distance
Knee	20%	23%
Muscle Tear (not Hamstring)	16%	15%
Tibia (Shin Splints/Stress Fractures)	15%	5%
Achilles Tendinitis	10%	14%
Hamstring Muscle Tear	9%	3%
Lumbar	8%	6%
Ankle	8%	14%
Foot	6%	15%
Others	8%	5%

DISCUSSION

There was a 16% rise in sporting injuries treated over the two years reviewed. This is most likely due to a general increase in sporting involvement by the community. A change in the referral pattern could also have contributed to the increase in injured athletes, but this did not occur during the study period. There was a much higher proportion of females (20%) than that noted by Sperryn in 1972, but the increase appeared to correspond with an increased female interest in sport and physical activity, as noted by Orava et al (1981).

The age distribution confirmed that most people engaged in active sporting pursuits which result in injuries are in the younger age group. This is in agreement with other studies (Newman et al, 1969; Sperryn, 1972; Grisogono, 1981). Contributing factors in the 16-25 year group included a very competitive nature, intense training programmes, as well as the sports they were undertaking.

The 15 year old and under group (6%) included a number of patients with osteochondritis and problems of over-exertion, rather than large numbers of acute traumatic injuries. Many of these children, due to teacher, family or peer pressure were participating in quite intense training programmes. These findings are similar to those of Orava and Puranen (1978) in adolescent Finnish athletes.

The majority of patients were between 16 and 25 years old (75%), and despite the possible bias from treating University students, this is similar to other studies (Newman et al, 1969; Sperryn, 1972; Grisogono, 1981). The 26 year old and over group (19%) also included large numbers of athletes with over-exertion problems, especially related to the sports of squash and long distance running.

In any study such as this, there are area differences in the participating sports available. In this case, there

were few acute skiing injuries seen as most of these had obviously resolved prior to the return to the clinic from distant skiing areas. Patients presented with only the more chronic muscle strains or knee injuries. When compared with the study by Newman et al in 1979, rowing has increased its injury contribution, but this is partially due to its popularity as a sport in Cambridge. Stallard in 1980 noted an increased incidence of back problems in rowing, and this was certainly noticeable in our study. Lumbar strain caused 28% of the injuries seen in rowers. Cricket injuries have probably been underestimated because of the closure of the clinic during the University Summer Vacation. Over half of the cricket injuries were chronic problems of the knee, shoulder and lumbar spine, many of which would not have become chronic if they could have been treated earlier.

Football and Rugby provide over one third of the total injuries with most of these being traumatic in origin and involving the lower limb. This has been noted by Weightman and Browne in 1974 and perhaps related to dangerous play in Rugby by Davies and Gibson in 1978. Certainly, in all patients reviewed at a Sports Injury Clinic the circumstances surrounding the injury need to be ascertained carefully. Problems with equipment, sportsground, training, technique and other participants can be elicited which, by follow-up, may prevent another injury occurring.

Patients with evidence of internal derangement of the knee (meniscal or cruciate damage) were referred for arthroscopy, sometimes on first presentation. Others only developed signs of locking as the acute swelling settled with physiotherapy and they were referred promptly. This, of course, may have still underestimated the cruciate problem as in 1980 Noyes et al demonstrated that in 186 patients with "typical knee strain", there were 72% with some disruption of the anterior cruciate ligament. However, this did not appear to affect our recovery rate with only a few continuing to have chronic instability.

Long distance running is rapidly gaining in popularity, but few studies have attempted to separate the differences in injury patterns from those occurring in running shorter distances. Table V demonstrates that the bursts of speed necessary in shorter distance running place more stress upon hamstring muscles and the tibia. Overall, the running injuries are very similar to those provided by Brody in 1980, except for our reduced incidence of achilles tendon problems. This probably can be attributed to education of the athlete with the use of better running shoes and heel wedges to correct the problem early.

CONCLUSIONS

(i) A Sports Injury Clinic can certainly be justified by the number of patients being satisfactorily treated. Without a clinic, many athletes would not seek help until the problem had become chronic, or would attend casualty areas which are not staffed by doctors or physiotherapists who understand the specific problem of sports injury. The self referral pattern for acute injuries has functioned extremely well for us, allowing treatment to commence before any chronic damage could occur. A five day a week service would appear to provide optimal benefit for the injured athlete, and from our experience, this does not attract trivial injuries.

(ii) The major benefit to be obtained is in providing the athlete with an early return to his sport. Many injuries, by becoming chronic, can also affect the patients working capacity and by preventing this development fewer working days are lost. Even with large patient numbers, some injuries are rare and the teaching role for hospital residents, local general practitioners and physiotherapists is invaluable. By ascertaining the cause of the injury, preventative measures can also be undertaken from organised Sports Injury Clinics.

(iii) Prevention cannot occur without adequate epidemiological studies. From these studies, problem areas can be identified and specific advice given. As the age of people involved in sport will probably increase, special attention will need to be given to those sports in which they are most likely to participate. This study defined the two areas of squash and long distance running particularly as causing injuries in middle aged athletes. Adolescent athletes will need to be reviewed carefully for problems of over exertion, and this may need a review of their training programme, as well as the psychological stresses that are being placed upon them.

In summary, Sports Injury Clinics with well trained staff can improve the community health by treating the acute injury when it occurs and keep athletes participating in the sport of their choice. This study has confirmed the necessity to develop these clinics to fulfill this role adequately. This need, however, must surely apply to the treatment and rehabilitation of any injury, whatever the cause.

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