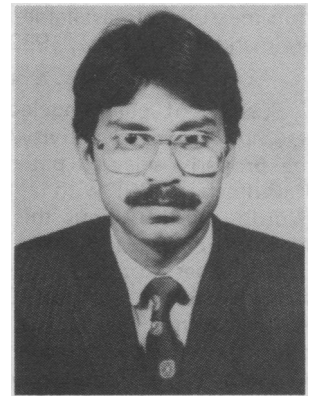


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## PRE-ASIAD '82 INJURIES IN ELITE INDIAN ATHLETES

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### ABSTRACT

Elite Indian athletes who were undergoing training at the NIS, Patiala for the preparation of IX Asian Games held in Delhi in 1982, suffered 317 injuries during the 14 months of training. Of the injuries 64 per cent were observed in males, while 36 per cent were observed in females. Most of the injuries seen were in the lower limbs (59.2 per cent) and when classified according to the tissues involved, most of the trauma was seen in ligaments (38 per cent). Female sprinters and male throwers contributed most injuries. On average, each athlete sustained three injuries during the total training period by which 50 days of training was lost in nursing various kinds of injuries. Preventive measures of lower limb injuries, vigorous treatment for athletes preparing for a competition and maintenance of cardiorespiratory fitness during treatment is an important task of sports physicians and coaches.

Key words: Athletes, Asiad '82, Injuries.

### INTRODUCTION

Track and field athletics are sports requiring a high level of physical performance on the basis of an individual's effort of high intensity training. Athletics is also considered as a basic sport for all games to improve upon basic physical efficiency. With the increase of mass participation in recreational and competitive sports and to achieve a higher standard of performance in international competitions, the training load has increased considerably. With the resultant upsurge in the hours of the training regime, the number and variety of injuries has also increased manifold. In modern sports, an adequate understanding of the management of sporting injuries allows an early return to work and to sport (Sperryn, 1977). Athletes preparing for a top level competition accomplish a high level of physical fitness by means of various methods of training. In spite of this, the number of injuries seen in conditioned players is more and number of hours of training are lost in nursing the injuries.

Robey et al (1971) stressed the continued need of epidemiological views to assess the incidence of injuries in each sport. The present study was carried out to investigate the incidence of injuries in top athletes preparing for the IX Asiad held at Delhi, India from 19 November '82.

### METHODOLOGY

A series of camps were organised by the Amateur Athletic Federation of India (AAFI) for the preparation of athletes for the Asiad '82 in 26 and 14 events for men and women, respectively. All the camps were of six weeks duration starting from September '81 followed by a break of 10-14 days till the

Asian Games which opened on 19 November, 1982. All the camps were held at Netaji Subhas National Institute of Sports, Patiala, in the Punjab and all athletes reported to the Department of Sports Medicine for any kind of injury they sustained in the months of coaching. A central record of injuries was maintained. All the athletes who were trained for the Asian Games were selected on the basis of their performance in the national competitions. To start with, there were 140 athletes, while in the last camp, only 65 were kept on the basis of their performance and they represented the country in the Asiad.

### RESULTS

Over the 14 months period from September '81 to November '82 a total of 317 injuries were recorded. Of the injuries 64 per cent were seen in males and 36 per cent in females. Out of the total injuries, the larger number were seen in the lower limbs (59.2 per cent) (Table I). When observed according to the types of tissues involved, the commonest sites were in ligaments (38 per cent) followed by muscle injuries (24 per cent) (Fig. 1). Injuries were also recorded in different categories of athletes and the highest incidence of injuries were observed in sprinters (20 per cent). Female sprinters attributed maximum injuries in their sex (26.3 per cent), while male throwers subscribed only 22 per cent of total injuries (Fig. 2).

In the lower limb, most injuries were observed in ligaments (36 per cent), followed by muscle (35.0 per cent). In ligamentous injuries, the collateral ligaments of the knee, and the medial and lateral talofibular ligaments of ankle were involved. In muscular injuries, the hamstrings, gastrocnemius and quadriceps contracted the bulk of the injuries.

In ligamentous injuries, where the maximum trauma were seen, the joints involved were knee (27 per cent), ankle (23 per cent) and foot (16 per cent) (Table II).

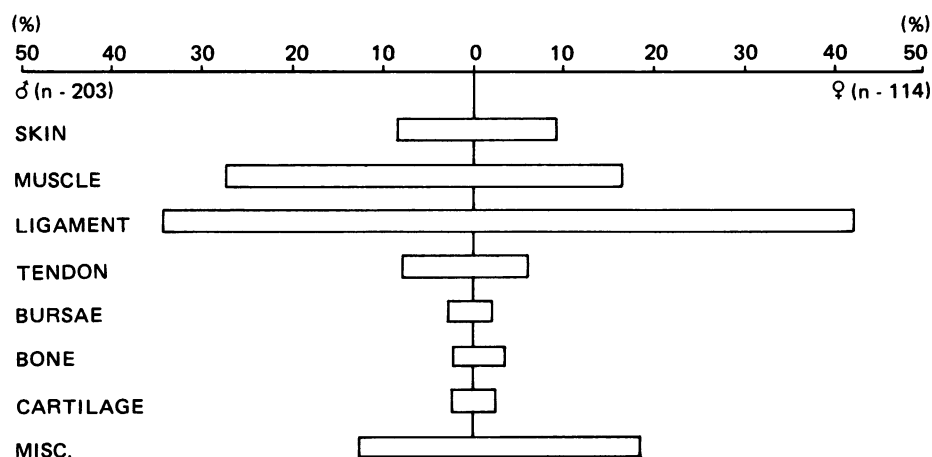


Fig. 1: Percentage incidence of injuries in different tissues of athletes (Males and Females).

TABLE I  
Anatomical distribution (per cent) of the injuries.

Site	Number	Distribution
Lower limb		59.2
Upper limb		10.0
Back		11.0
Trunk		3.0
Miscellaneous		16.8

Among muscular injuries, the hamstrings, constituted the largest group of muscle strains (27 per cent) followed by the erector spinae group (16 per cent) (Table II).

TABLE II  
Percentage incidence of the injuries in different groups of muscles and ligaments.

Muscles	No.	Percent- age Incidence	Ligaments	No.	Percent- age Incidence
Hamstring	27		Knee	27	
Erector spinae	16		Ankle	23	
Gastrocnemius	15		Foot	16	
Quadriceps	13		Sacro-iliac	10	
Abdominal	10		Shoulder	7	
Trapezius	4		Wrist	5	
Biceps	4		Elbow	4	
Iliopsoas	2		Interspinous	4	
Tibialis anterior	2		Interphalangeal	3	
Forearm extensor	2		Hip	1	
Adductor hip	2				
Gluteus medius	2				
Sternocleidomastoid	1				

observed in sprinters (20 per cent). Female sprinters contributed maximum injuries in their sex (26.3 per cent), while male throwers subscribed only 22 per cent of total injuries (Fig. 2).

## DISCUSSION

It is generally accepted that the majority of the injuries which occur during the training period are associated with training errors (James et al, 1978). Stiffness of the joints and tendon injuries are also common due to training on synthetic surfaces (Haberl and Prokop, 1974). However, the athletes of the present study were being trained on three types of surfaces, synthetic track, tartan track, and on grassy fields. The long distance runners and walkers used roads.

Female sprinters, in the present study, contributed the

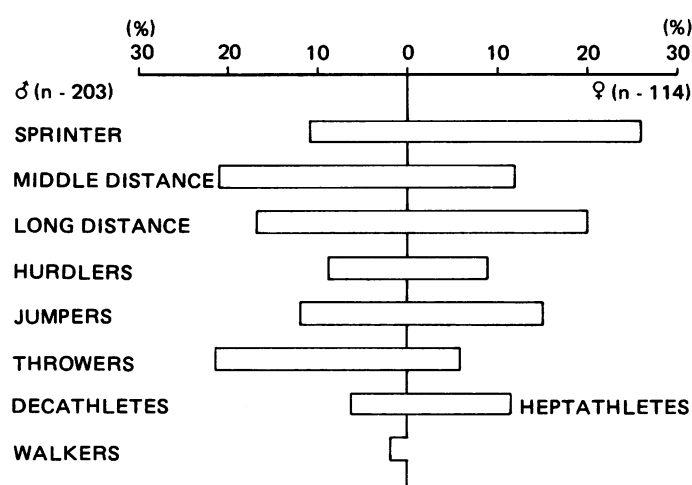


Fig. 2: Percentage incidence of injuries in different events (Males and Females) of track and field.

most injuries, 26.3% among the women trainees, with injuries mainly to the lower limbs, affecting the hamstrings, quadriceps and gastrocnemius muscles, and the ligaments of the foot, knee and sacro-iliac joints. Female sprinters also shared injuries in the miscellaneous group in the form of shin-splints, stitch and plantar fasciitis.

Male sprinters showed a higher incidence of injuries in the form of Achilles peritendonitis, sub-Achilles bursitis, hamstring and quadriceps muscular strain and in the miscellaneous group, shin-splints.

Male throwers contributed 22 per cent of the injuries in their group. The upper limb, trunk and back muscles involved were the erector spinae, the abdominals, the trapezius and supraspinatus, while the ligamentous injuries were established mainly in the knee, the lumbosacral and the shoulder joints. Davies (1980) observed that throwers along with high and long jumpers are prone to muscle injuries of the spine especially of the erector spinae. Groh (1972) has also observed rupture of the back extensors and avulsion fracture of the cervical and thoracic spine. Litten (1971) reported sprain of the ligaments with serious back muscle injuries. Tendinous involvements were seen in the biceps and Achilles tendons, while bursae involved were the sub-acromial and sub-Achilles.

Male middle distance runners showed 21% of the injuries, mainly in the hamstring muscles and knee injuries like patello-femoral pain and of collateral ligaments, miscellaneous injuries

like muscle stiffness, corns and callosities. Female middle distance runners had no injuries in the muscles but ligamentous injuries of the knee and ankle with tendon involvement of both tibialis anterior and Achilles tendons.

Female long distance runners were the second largest group in their sex with more ligamentous injuries of the foot and ankle and miscellaneous injuries like shin-splints, metatarsalgia and muscle stiffness. No injury of tendon, bursae, cartilage and bone was seen. Male counterparts had the predominance of cartilage injuries, chondromalacia patellae, early osteoarthritic changes and cystic meniscus and knee injuries of the collateral ligaments and patellofemoral pain.

Male hurdlers had mainly strains of the lower limb muscles and ligamentous injuries of the interspinous and sacro-iliac joints. Female hurdlers had skin injuries in the form of contusions caused at the time of crossing the hurdles and ligament injuries of the ankle and foot. No muscular strains were seen.

Male jumpers had more incidence of skin injuries in the form of bruises and contusions with Achilles peritendonitis and extensor tenosynovitis of the foot. Lower limb injuries of the muscles and ligaments were again frequent. Female jumpers suffered from ankle sprains mainly, and fractures of the metatarsals, as well as the usual hamstring muscle strains.

Decathletes showed a higher incidence of upper limb injuries involving biceps muscles and ligaments of acromioclavicular, elbow and wrist joints. Among the heptathletes were two cases of stress fracture of fibula, and one case of prolapse of an intervertebral disc, apart from the ligament sprains of the ankle, foot and wrist.

Walkers who were the lone trainees contributed the minimum incidence of 2% with involvement of the knee, the Achilles tendon and a problem with neuralgia. There was also one case of thrombophlebitis of the leg.

In a series of eight camps of 322 days of training with an average of 2 sessions per day by each athlete. In the total duration of 644 training sessions 317 injuries were seen. This indicates that approximately one injury was being sustained every day amongst the track and field athletes. The number of injuries did not appear so high when observed from the number of training sessions.

There were 140 men and women in the first three camps and this subsequently was reduced to 120 in the fourth camp, to 80 in the fifth, sixth and seventh camps and finally 65 were selected in the last camp. Thus, on average, 108 athletes were

in training in the total duration of the camps and each athlete sustained approximately 3 injuries in the 14 months of training prior to the competition. The incidence might be considered a little high but minor injuries, for which patients normally do not report, were taken into consideration. Muscular and ligamentous injuries which were the largest among all the injuries, usually take 3 to 4 weeks for complete recovery. This proves that on average each athlete lost approximately 50 days of training while convalescing from some injury or other which is highly significant in the proper preparation of the athlete for an important international competition.

Special emphasis should be laid on the prevention of the lower limb injuries and especially of the muscle and ligamentous injuries of the knee and ankle.

Proper documentation helps us to know the area where maximum attention should be given by the coaches and physicians while formulating training schedules.

Injuries prior to the competition need a vigorous physiotherapeutic service to shorten the convalescence period since every training session is important. Appropriate precautionary measures in the form of proper supervision on warming up and gradual building up of the training load depending upon the surface used for training should be considered.

During the convalescence period, cardiorespiratory fitness must be maintained by means of exercise other than that of the injured limb, to limit the effects of detraining.

Early treatment should be taken to prevent the injury from taking a chronic form which shall affect the physical work capacity of the athletes and hinder the performance in a major competition.

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## CORRESPONDENCE

The Manor House,  
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Bury St. Edmunds,  
Suffolk

To the Editor:

Dear Sir,

### STRESS FRACTURE OF A RIB

In view of the increasing popularity of windsurfing I wish to report a stress fracture of my left first rib and the diagnostic problem caused by that event. I am 16 years old, 5' 7½" tall and weigh 9½ stone. I am fairly fit as I actively pursue many sports.

I had been windsurfing regularly throughout the year when in early September whilst windsurfing on an inland gravel pit

in a force five wind with a six square metre sail and a short board, I felt a sudden sharp and agonising pain in my upper left chest which forced me to stop windsurfing.

Soon after I developed a cough with pain on deep breathing and coughing. A week later I started to play hockey for the Town Men's Hockey Club. During a match, two and a half weeks after the windsurfing incident, my right shoulder collided with another player causing the same intense pain to return to my left upper chest.

Two days later I was examined by my Family Doctor who diagnosed pleurisy on hearing a loud "rub". To be certain he requested an X-ray of my chest and the Consultant Radiologist diagnosed from that X-ray a stress fracture of my left first rib, confirmed by a further X-ray a week later.

Yours faithfully,

John PEREIRA