

A Study to Determine The Type of Knee Injuries Sustained During Assault Course Training in Military Personnel

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ABSTRACT

Objective: To present extreme physical activity in military personnel can lead to a torn anterior cruciate ligament.

Study design: Retrospective descriptive Study

Place and duration of study: Rawalpindi and Multan 9 years period

Method: We evaluated the results of 1577 personnel (patients) over a nine year period who sustained an acute injury to the knee joint while doing assault course training. 1278 (81%) of these injuries occurred while crossing a 9ft wide ditch (Figure 1).

Results: 759 (48%) were anterior cruciate ligament tears either alone or in combination with a medial or lateral meniscus injury.

The patients were initially evaluated by a brief trauma history as well as clinical examination; a further cohort underwent arthroscopy.

Conclusion: We concluded that improving preventive measures in the form of better training during assault course as well as increasing clinical awareness amongst the medical officers dealing with these injuries initially, will improve the management outcome. There was also a need to further improve the training of the orthopaedic surgeons so that arthroscopic ACL repairs in carefully selected patients will help in overcoming this challenging knee injury.

Keywords: Assault Course Training; Haemarthrosis; Anterior Cruciate Ligament; Prolonged Disability

INTRODUCTION

Assault course training is a part of routine military exercises undertaken by serving officers and men. It is a part of a training cycle all year round to keep them battle ready.

The assault course consists of a series of physical tasks that they have to perform in a certain manner within a specific time period. It includes tasks like assaulting a wall, running over a narrow beam, crossing a hurdle by means of a rope and other obstacles. It also includes jumping a 9ft. wide ditch (Figure 1). It has been observed that the maximum number of injuries occurred while jumping the ditch (80%).

We studied the types of injuries that occurred during assault course training over a nine year period.

METHOD AND MATERIALS

The initial survey was from January 1993 till June 1996 in CMH Rawalpindi, a tertiary referral centre of Pakistan Army.

The second period was from January 2000 till June 2005 in CMH Multan, a secondary referral centre

All military personnel reporting to the clinic whether through the emergency clinic or from satellite clinics (M.I. Rooms) or those referred from other hospitals were first assessed by a medical officer.

A brief trauma history, clinical examination and an x-ray of the knee (AP/Lat) were the basic parameters on which they were evaluated. A further sub-group underwent arthroscopy of the knee^{1, 2}. In our study we used the diagnostic component of the Arthroscopy as some of the procedures done in the same sitting were not part of our study.

No MRI Scans were done on any subject as this facility was not available at that time.

Inclusion criteria: 1577 serving personnel who sustained an acute injury to the knee joint while undergoing assault course training were included

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in the study⁵ group. There were 22 patients who presented twice during this period.

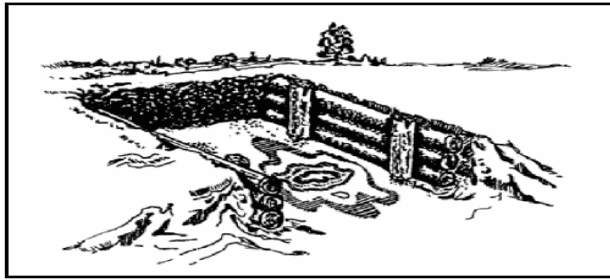
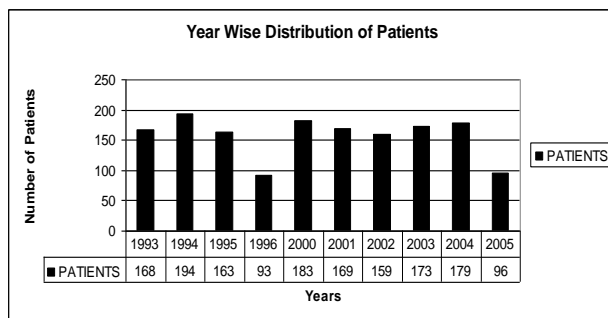


Figure 1: 9ft wide ditch

Table 2: Graph of "Year Wise Distribution of patients"



Arthroscopy

There were 1056 patients who belonged to the Arthroscopic Patients Group

Criteria for Arthroscopy

1. haemarthrosis
2. severe pain and unstable knee^{3, 7}
3. persistence of symptoms
4. persistence of signs
5. locking of knee joint⁷

Table 3: Graph of "Year Wise Distribution of AArthroscopic Group of Patients"

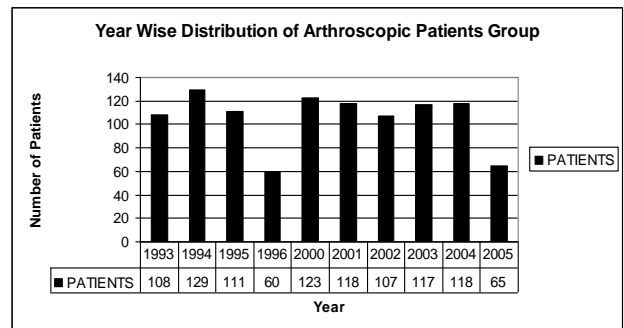


Table 4: Types of Knee Injuries as Diagnosed

	Number of Patients	Percentage (%)
Total ACL injuries	735+24	48
Traumatic synovitis	497	31.3
Collateral lig sprains including medial collateral ligament and posterolateral corner injuries ⁴	253	16.0
Torn anterior cruciate ligament	201	12.7
ACL tear + medial meniscal	248	15.7
ACL tear + lateral meniscal	286	18.1
Isolated tears of medial meniscus	37	2.3
Isolated tears of lateral meniscus	16	1
Associated Fractures		
Auulsion Fx. tibial spine	24	1.5
Tibial pleateau fractures	15	1.0

DISCUSSION

We reviewed other studies. Another similar study of military personnel¹³ undergoing sports related or training related injuries, the knee was the most significant body area which was affected. Another study highlighted the role of nutritional status¹² of

incidents to such injuries. The gender differences and their impacts in such injuries were inconclusive, and further they did not affect our study population as no female were documented.

A number of studies have shown that isolated ACL injuries are not prevalent rather it is a

continuum of associated ligaments which are injured during a traumatic event¹¹, and it requires extensive rehabilitation to overcome this disability and make these individuals operational again⁵.

Anterior cruciate ligament injuries occur in a significant number of personnel while doing assault course training. There was a 48% incidence of tears either alone or combined with medial meniscus tear or lateral meniscus tear. All ACL tears seen arthroscopically were mid-substance tears, except those associated with avulsion fractures of the tibial spine. These were also considered part of the ACL tear group.

ACL injury causes a significant morbidity in these individuals. Not all will require ACL reconstruction⁷. However even if carried out Arthroscopic ACL reconstruction requires expensive equipment⁸, proper training and a centre should be dedicated for this purpose.

Furthermore preventive measures in the form of better training should also be imparted to reduce the incidence of this serious knee injury.

To make these individuals able to perform their military duties requires an extensive programme of rehabilitation which in turn is dependant on the motivation of the individuals, their educational level, and most importantly the quality, training and facilities of the rehabilitation institutions

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RECORD

Assault Course Training				
S/No	_____	Date	___ / ___ / _____ (DD/MM/YYYY)	
Age:	_____			
Date of Injury:	___ / ___ / _____ (DD/MM/YYYY)			
Cause of Injury	Jumping over ditch	Yes	No	
	Other Injuries	Yes	No	
Emergency / M. I. Room				
Referral from CMH:	Yes	No		
Clinical Feature				
Able to bear weight	Yes	No		
Haemarthrosis	Yes	No		
Effusion	Yes	No		
Bruising / Ecchymosis	Yes	No		
Stress test	Yes	No		
Lochmans	Yes	No		
X-ray Knee				
Fracture	Yes	No		

ARTHROSCOPY RECORD

Date _____ NMB _____
 Surgeon _____ Hospital No. _____
 Assistant _____ Date of Birth _____ Ward _____
 Anaesthetic _____

Code : U - E - WL
 Reason for Arthroscopy : _____
 Clinical Diagnosis : _____
 Arthroscopic Diagnosis : _____

Tourniquet : _____

Instruments : Rigid / Powered _____
 Irrigation : _____
 Portals : _____
 Complications : _____
 Previous Ops. _____
 Effusate : _____
 Debris : _____
 Loose Bodies _____
 Foreign Bodies : _____
 Closure : _____
 Notes : _____

Synovium : _____
 Adhesions : _____
 Plicae : _____
 Tracking : _____
 Med. Fem. Cond. : _____
 Med. Tib. Plateau : _____
 Medial Meniscus : _____
 Lat. Fem. Cond. : _____
 Lat. Tib. Plateau : _____
 Lateral Meniscus : _____
 Collateral Ligaments : _____
 Cruciates : _____
 Posterior Comp. _____