INTRODUCTION
CHAPTER 1

INTRODUCTION

Good coordination and balance is vital to the sports person. The quicker the reactions, the more chance the individual has of having "the edge" over the opposition, or of improving his or her personal best. As with most of the systems, the neurological system can be trained and improved with repetitive exercises. New and extended movements may be progressively attempted, practiced and perfected involving action through the use of the musculoskeletal systems and, as importantly, the voluntary nervous system to initiate those actions.

Theorists have pointed to the contribution of neurological system to the performance of the athletes of different sports due to the requirement of different motor actions (Payne & Morrow 1993). Evidence suggests that strength increases in line with the development of the nervous system, which is of primary importance in the exertion and development of muscular strength (Wilmore & Costill 1994).

Nerve conduction testing (NCT) is an objective method of assessing the functional status of the peripheral nervous system (DeLisa et al. 1994). The basis for NCT resides with the proximal and distal reaction propagation that occurs along an entire nerve after electric stimulation. Motor nerves that are readily and commonly measured include the median, ulnar, common peroneal, and posterior tibial (Lenman & Ritchie 1987). The findings
of nerve conduction velocity may give explanations for poor performance of
the athletes due to poor muscle coordination and/or weakness of muscle
actions (Wilbourn 1990). In addition to this, with the growth of athletic
participation there has been a commensurate increase of sports-related
neurologic disorders. Prompt evaluation and treatment of the professional and
recreational athlete enable an earlier return to competition (Treihaft 2000).
Neurologic injuries involve the central nervous system, defined as the brain
and spinal cord, and the peripheral nervous system, the nerves and muscles
lying outside the spinal column in the extremities and trunk. Peripheral nerve
injuries in sports are caused by trauma, compression, and traction. The
severities of nerve injuries are (a) Neurapraxia-deformation of nerve fibers (b)
Axonotmesis-interruption of nerve fibers (c) Neurotmesis-interruption of
whole nerves. Most sports-related traumatic peripheral nerve injuries result in
transient motor and sensory symptoms and fall under the first category,
neurapraxia. Nerve conduction velocities best evaluate them and it confirms
the diagnosis, identify neurologic disorders in athletes.

The nerve conduction studies preferably bilaterally multiple
nerves of both upper and lower limbs to demonstrate the characteristic
symmetry or asymmetry of abnormalities. The Nerve conduction studies are
used by neurologists/sport scientists in the evaluation of patients/sports
persons with or without symptoms of diseases of the peripheral nerves.

There is a shortage of research findings in the field of the
neurosciences of athletes of different sports in India. The present study was
conducted on male athletes aged 18-25 years who were asymptomatic to see
A Study on Nerve Conduction Velocity in Athletes - Introduction

the motor nerve conduction velocity (MNCV) of selected nerves of both upper and lower limbs.

1.1 Aims

- To study MNCV in male athletes of Aerobic group, Anaerobic group & Mixed group.

- Compare the MNCV of athletes of different groups with control group.

- To study the relationship (if any) of selected anthropometric variables with MNCV.

1.2 Hypothesis

- It was hypothesized that the MNCV of athletes of different groups were different from the normal individuals.

- It was hypothesized that the MNCV was also vary among the athletes of aerobic, anaerobic & mixed groups.

- It was further hypothesized that certain anthropometric variables under the study were correlated with the MNCV.

1.3 Limitation(s)

- The individuals who were act as subjects in this study were from different background and living under different conditions. Thus the effects of their diet, rest and working schedule, which was not
within the control of research scholar, was recognized as the limitation of the study.

• A difference in the previously acquired fitness level was considered as other limitation of the study.

• The individuals who were act as subjects in this study were athletes of college & university level.

• To observe motor nerve conduction velocity ‘Neuperfect’ equipment was used.

• To observe motor nerve conduction velocity surface electrode placement method was used.

1.4 Delimitation(s)

• The study was delimited to 150 male athletes of selected games/sports & 50 normal subjects.

• The study was delimited to 18-25 years age group.

• The study was further delimited to the selected variables of anthropometry and MNCV of selected nerves

1.5 Significance of the Study

The present study explores the Motor Nerve Conduction Velocity (MNCV) of selected nerves of the upper and lower extremities of athletes of different sports. The study may also reveal the relationship of
selected anthropometric variables with MNCV of selected nerves of the upper extremity and lower extremity.

The findings of the present study may give explanations how to improve athletic performance by optimizing the function of nervous system. In addition to this, the results of the present study may provide objective measures of motor nerve function and also help in predicting the prognosis of neuropathy if any in athletes. With the growth of athletic participation there has been a commensurate increase of sports-related neurologic disorders. Prompt evaluation and treatment of the professional and recreational athlete enable an earlier return to competition.