INTRODUCTION
Ephedrine is a sympathomimetic amine. Chemically it is an alkaloid. It occurs in various plants belonging to the genus ephedra. Ephedra is a gymnosperm related to the pines and firs. The plants of genus ephedra are also indigenous in India. Ephedrine containing herb known in Chinese language as Ma Huang was being used by Chinese for more than 500 years. The pure alkaloid was separated from Ma Huang as long back as 1887. In 1888, the Japanese workers Takahashi and Miura concluded that ephedrine causes dilatation of the pupil through stimulation of the sympathetic nerves. The Japanese workers could also employ it for the treatment of asthma which still remains to be the most important use of the drug. But ephedrine remained in oblivion till the first quarter of the twentieth century. It was in 1923, a Chinese druggist who assured K.K. Chen, a Chinese scientist of American nationality working in U.S.A., that Ma Huang was really a potent drug.

Chen and Schmidt (1924) undertook systematic investigations on ephedrine in U.S.A. They reported that action of ephedrine on the heart are similar to those of adrenaline (known as epinephrine in U.S.A.) - a hormone of adrenal medulla which plays an important role in controlling the sympathetic activity of man and animals. The classical investigation of Chen and Schmidt (1924) made many clinical and experimental
investigators interested in ephedrine leading to numerous research publications. Chen and Schmidt (1924) also reported that unlike adrenaline, ephedrine can be given by mouth. In the same era a synthetic sympatho-mimetic amine amphetamine was investigated by Pines and Co-workers (1930), Hartung and Munch (1931), Alles (1933) and Tainter (1933). It was soon marketed and lead to many investigations and was realised that amphetamine has got marked action on the brain including the higher centres thus, the potential of amphetamine to allay fatigue, to make person confident and to improve the work out put in certain tasks was realised. The second world war gave impetus to research on the central nervous system actions of the amphetamine in a bid to exploit the drug for improving the performance of the soldiers. The earlier work on the amphetamine was reviewed in 1941 in a Journal 'War Medicine' by Ivy and Krasno. The wide publicity lead to wide spread use of amphetamine to improve mental and physical performance including the performance in sports. Rather controlled clinical experiments were undertaken to assess the effect of amphetamine on the performance of swimmers, weight throwers, shot putters, and various track events etc. The work on the action of amphetamine on athletic performance has been reviewed by Weis and Laties (1962). The drug became very popular among the sportsmen and was
widely used by them to improve the performance specially during competitive events.

Ephedrine has also got central nervous system stimulating actions but C.N.S. stimulation caused by ephedrine is much less marked specially on the higher C.N.S. (Goodman and Gillman, 1955); However, allaying of fatigue as well as enhancement of confidence, the actions of sympathomimetic amines believed to improve mental and physical performances, are exerted on higher C.N.S.

In an international congress, it was decided that - 'All international competitions shall be held under the rules of International Amateur Athletic Federation and this shall be stated in all announcements, advertisements, programmes and printed matter. The rules laid down shall be applicable to men and women competitions'. (Y.M.C.A. Publication on rules of games and sports, 1973). Rule 144 of I.A.A.F. as reproduced in Y.M.C.A. Publication on rules of games and sports (1973) states 'Doping before or during competition is forbidden. Doping is the use by or distribution to a competitor of certain substances which could have the effect of improving artificially the competitor's physical and/or mental condition and so augmenting his athletic performance.' Thus, according to rule 144 amphetamine as well as ephedrine are included
in the list of doping substances (Y.M.C.A. publication on rules of games and sports, 1973).

Amphetamine has been very widely studied as far as its actions on the central nervous system and muscular performance are concerned (see reviews by Ivy and Krasno, 1941 as well as by Weis and Laties, 1962), but unfortunately such studies on ephedrine are lacking. In view of the mild action of ephedrine on the central nervous system as compared to amphetamine, it is not unexpected that the main use of ephedrine is in the treatment of bronchial asthma and uses (or even abuse) of amphetamine are based on its actions on C.N.S.

In 1972 Olympic games, Rick De Mont, an asthmatic was eliminated from competition and deprived of an earned gold medal because his medication contained ephedrine. (Williams and Thompson, 1973).

In view of the fact that there is absolute lacuna as far as effects of ephedrine on muscular performance are concerned, it was decided to undertake the present studies.