Possible protective effect of verapamil against isoprotrenol induced myocardial damage in rats

Summary and conclusion

Objective: This study was conducted to assess the possible protective effect of verapamil (ca++ channel blocker) against isoproterenol (B-adrenergic stimulant) induced myocardial damage.

Materials and methods: Fifty adult male albino rats were used in this study, they were divided into five equal groups (10 rats each) as follows:

Group I : Served as control group.

Group II :Were injected with isoproterenol for 7 successive days and sacrificed 24 hours after the last injection.

Group III : Were injected with verapamil 10 minutes prior to isoproterenol for 7 successive days and sacrificed 24 hours after the last injection.

Group IV and V: Were treated as group II and III successively, but were sacrificed 21 days after the last injection.

Pieces from the left ventricular wall of allrats were taken and processed to be examined with light and electron microscopes.

Results: By light microscope, the myocardium of rats injected with isoproterenol showed atrophic fragmented muscle fibers, infiltration with inflammatory cells, congested blood vessels and extravasation of R.B.C.s. By E.M., the cardiomyocytes showed myofibrillar lysis, disrupted Z – bands, dark nuclei with clumped chromatin and swollen vacuolated mitochondria with disrupted cristae.These cardiotoxic effects were more obvious in group IV than in group II Whereas the myocardium of rats injected with verapamil prior to isoproterenol showed preserved architecture of the myocardial bundles with few fragmented cardiomyocytes and minimal extravasation of R.B.C.s. Ultrastructurally ,

myofibrillar architecture was partially preserved with hazy cross striations and few areas of myofibrillar separation and lysis, mitochondria showed tightly packed cristae and the nuclei appeared euchromatic with minimal peripherally condensed chromatin. These cardioprotective effects were more obvious in group V than in group III.

Conclusion: It is concluded that rat's myocardium could be protected by pretreatement with verapamil which minimized the myocardial damage induced by isoproterenol.