The Protective Action of Inosine
On The Isolated Hypoxic
Rabbit Heart

BY
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ABSTRACT

Physiologic and metabolic effects of inosine were examined in the isolated rabbit hearts under hypoxic conditions in presence and absence of glucose. Inosine at a concentration of $10^{-3}M$ improved the myocardial performance of the hypoxic heart as indicated by maintaining the level of the left ventricular pressure. This improvement is enhanced in the presence of glucose since the left ventricular pressure maintained at approximately 40% of control value in presence of glucose while it decreased to 12% of control value in the absence of this metabolite.

No significant effects of inosine on the heart rate were observed during infusion of inosine in the presence or absence of glucose. Inosine had a vasodilatory effect on coronary arteries, so it maintained the coronary flow higher than the control values by 37.3% in presence of glucose and 36% in its absence by the end of experiment. Simultaneously with increased performance, $10^{-3}M$ inosine maintained the myocardial contents of adenine nucleotides and creatine phosphate more effectively in presence of glucose than its absence, thus the recovery of the ATP in presence of glucose was greater than its absence. These results suggest that the positive inotropic effect of inosine on LVP is mediated by its effects on myocardial contents of adenine nucleotides in rabbit heart.
There are two possible mechanisms for the action of inosine on the adenine nucleotides:

1 - Increased production of ATP and adenine nucleotides through the salvage pathway.

2 - Increased production of ATP and adenine nucleotides through the glycolytic pathway since inosine increased the utilization of glucose.

The results of this study suggest that inosine provide some protective action in hypoxic cardiac tissues through the maintenance of adenine nucleotide levels and its vasodilatory action.