26402 - TRIODO-THYRONINE REVERSES ANGIOTENSIN INDUCED CARDIOMYOCYTE B-MHC EXPRESSION

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INTRODUCTION

Pathological hypertrophy compromises cardiac contractility and could lead the development of heart failure inevitably. Angiotensin II (Ang II) induces an increase in myocardial mass with a compromised contractility accompanied by a shift from the adult isoform α -myosin heavy chain (α -MHC, the high ATPase activity isoform) to the fetal isoform β -MHC (the low ATPase activity isoform), which is considered as a pathological hypertrophy and inevitably leads to the development of heart failure. In contrast, thyroid hormone-induced cardiac hypertrophy is similar to that observed in physiological hypertrophy which is associated with high cardiac contractility and increased α -MHC expression. The present study is designed to assess the effect of thyroid hormone on angiotensin II-induced hypertrophic growth of cardiomyocytes in vitro.

METHODS

Cardiomyocytes were prepared from hearts of neonatal Wistar rats. The effects of Ang II and 3, 3', 5-triiodo-thyronine (T3) alone or their combination (T3 + Ang II) on incorporations of [3H]-Thymine and [3H]-Leucine, MHC isoform mRNA expression, protein kinase C (PKC) activity and PKC isoform protein expression were studied.

RESULTS

Incubation of cultured cardiomyocytes with Ang II resulted in enhanced [3H]-Leucine incorporation, β -MHC mRNA expression, PKC activity and PKC α expression, and reduced α -MHC mRNA expression as compared to cultured Cardiomyocytes treated with culture medium alone ($P < 0.05$). T3 treatment prevented Ang II induced increases in PKC activity, PKC α and β -MHC mRNA overexpression and favored α -MHC mRNA expression ($P < 0.05$, T3 + Ang II vs Ang II).

CONCLUSION

Thyroid hormone appears to be able to reprogram gene expression in Ang II-induced cardiac hypertrophy and PKC signal pathway may be involved in such remodeling process.