Some Notes on the Turnover of Myocardial Protein and Actomyosin

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Several factors which influence the turnover rate of myocardial protein and actomyosin are studied in clinically and experimentally.

The increase of content of protein in the diet accelerates the turnover of the myocardial protein. The half lives of myocardial protein of rats fed with diets of 6, 30, and 60% casein are 7, 5.8 and 5.5 days respectively. The half life of left ventricle protein is 23 days determined in dogs by using $^{14}\text{C}$-leucine and that of actomyosin is 48 days, meanwhile, skeletal muscle actomyosin has 110 days half life. This difference suggests that the turnover of tissue proteins is depend on its functional characteristics and varys from organ to organ.

Overload of myocardium altered the metabolism of protein and actomyosin. The extent of incorporation of $\text{C}^{14}$-amino acid into myocardial actomyosin in early stage of diastolic overload of left ventricle after production of experimental aortic insufficiency is as twice as that observed in relatively stable stage showing a-bout the same value as in controls (Fig. 1). The same extent of incorporation observed in both left and right ventricle suggests that the overload in left ventricle may strain the right side. The incorporation of actomyosin with elevation of EDP of left ventricle, but in the cases with congestive heart failare in which the myocardial substrate metabolism shows the anaerobic tendency decreased extent is observed.

As to the turnover rate of left ventricle actomyosin in the diastolic overload, the rapid turnover which becomes remarkable by administrating vitamin $\text{B}_12$ is observed in an early period and the control level of the rate is shown stage (Fig. 2). The increased incorporation of $\text{N}^{15}$-glycin into the myocardial protein is observed in the left ventricle protein in the cases with aortic insufficiency and in the left atrial muscle protein in the cases with mitral stenosis in human subjects.

From these results obtained here, it may be assumed that increase in the turnover rate and in incorporation of myocardial protein and ac-

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during the successive period of relatively stable tomyosin may be an important compensatory factor on the heart with overload and that changes of energy production altered the synthesis of actomyosin in the myocardium.

REFERENCES


Fig. 2. Disappearance of radioactivity from actomyosin of left ventricle and skeletal muscle.