

Abstract

Title: Effect of acute and chronic exercise on rat secretory function

Background. Exercise induces certain physiological changes such as altered hemodynamic and reduced blood flow to kidneys. These changes would affect pharmacokinetics of some drugs. However, little is known about the interaction between exercise and renal excretory process. The objective of this study is to investigate the effect exercise on organic anion transporters (Oats) function, a major transporters expressed in basolateral membrane of renal proximal tubule.

Method. Male Wistar rats were randomly divided into 4 groups: non-exercise, acute exercise, exhaustive exercise and training exercise. Renal Oat1 and Oat3 function were examined by measurement of *p*-aminohippurate (PAH) and estrone sulfate (ES) uptake into rat renal cortical slices, respectively. The amount of Oats protein expression was used to examine whether the alteration of Oats function might be associated with downregulation of Oats protein.

Results. All type of exercises had no effect on PAH uptake into rat renal cortical slices, suggested that exercise did not change Oat1 function. Whereas, only exhaustive exercise reduced ES uptake into rat renal cortical slices, suggested impairment of Oat3 function. The reduced in Oat3 function was gradual recovered at 6 h after exhaustive exercise. The impairment of Oat3 function after exhaustive exercise was accompanied by decreased renal Oat3 protein expression compare with non-exercise rats. Thus, the decreased in Oat3 protein expression is sufficient to explain the reduction in Oat3 function after exhaustive exercise.

Conclusion. Exhaustive exercise decreased Oat3 function and associated with downregulation of Oat3 protein. In addition, this impairment of Oat3 function and expression was transient and gradual recovered at 6 h after exhaustive exercise. As a result, exhaustive exercise may have an impact on rat renal organic anion excretion.

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Keywords : exercise, exhaustive exercise, organic anions, transport function