New Taipei Journal of
Medicine

Original

Superoxide Dismutase Gene Expression in the Heart of Deoxycorticosterone Acetate-salt-induced Hypertensive Rats

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Key Words
Gene
Superoxide dismutase
DOCA-salt rat

ABSTRACT

Background. Reactive oxygen species (ROS), such as superoxide anion radicals ($\bullet O_2^-$), hydrogen peroxide (H_2O_2), hydroxyl radicals (•OH), and others, may play critical roles in the pathogenesis of hypertension and other pathological processes. A previous study showed increased superoxide dismutase (SOD) gene expression in rat hearts of spontaneously hypertensive rats (i.e., congenital hypertension). SOD is a naturally existing antioxidant which plays an important role in scavenging oxygen free radicals.

Aim. To determine if changes in the SOD gene occur in the rat heart during a hypertensive state, the present study compared this gene in deoxycorticosterone acetate-salt (DOCA-salt)-induced hypertensive rats with normotensive Wistar-Kyoto rats (WKY).

Methods. We measured the mRNA and protein levels of 2 main subtypes of SOD (Mn-SOD and Cu, Zn-SOD) in hearts of 6, 9, and 12-week-old DOCA-salt-induced hypertensive rats and compared the values with those of age-matched normotensive WKY rats.

Results. By using Northern blot analysis of SOD-mRNA, DOCA-salt-induced hypertensive rats and normotensive WKY rats showed no statistical differences. The protein levels also showed similar changes.

Conclusions. This study shows that SOD gene expression is similar in acquired hypertensive (DOCA-salt) rats as well as in normotensive rats, which indicates that SOD gene expression is possibly not well correlated to changes in blood pressure in these rats with acquired hypertension.

(N. Taipei J. Med. 2002;4:167-174)

INTRODUCTION

Reactive oxygen species (ROS), such as superoxide anion radicals ($\bullet O_2^-$), hydrogen peroxide (H_2O_2), hydroxyl radicals (•OH), and others, may play critical roles in the pathogenesis of hypertension and other pathological processes.[1] It is well known that ROS can result in cell damage by reacting with various cellular constituents, including membrane lipids, proteins, and DNA. There is also evidence that ROS can influence

Received: April 10, 2002
Accepted: June 11, 2002

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