



[Am J Physiol Regul Integr Comp Physiol.](#) 2006 Feb;290(2):R449-55. Epub 2005 Sep 22.

Dietary NaCl supplementation prevents muscle necrosis in a mouse model of Duchenne muscular dystrophy.

[Yoshida M](#), [Yonetani A](#), [Shirasaki T](#), [Wada K](#).

Department of Degenerative Neurological Disease, National Institute of Neuroscience, National Center of Neurology and Psychiatry, Tokyo 187-8052, Japan.
yoshidam@ncnp.go.jp

Abstract

The mdx mouse is an animal model for Duchenne muscular dystrophy. Mdx mice fed a 12% NaCl diet from birth up to 20 days of age (mdx-Na mice) had an approximately 50% reduction in serum creatine kinase (CK) activity compared with mdx mice fed a standard diet. Most notably, necrotic fibers in tibialis anterior (TA) muscle of mdx-Na mice were reduced by 99% and were similar in control mice. These mdx mice displayed significantly elevated blood Ca²⁺ and Na⁺ levels, while the total calcium content of their TA muscle was reduced to the level of control mice. In addition, mdx-Na mice had elevated zinc and magnesium contents in their TA muscle. These results suggest that elevated serum Na⁺ leads to Ca²⁺ extrusion from muscle via the Na⁺/Ca²⁺ exchanger causing a decrease in intracellular Ca²⁺ levels and an increase in blood Ca²⁺ levels. Extracellular Ca²⁺ and, in addition, Zn²⁺ and Mg²⁺ might also contribute to the stabilization of the cell membrane. Other possibilities explaining the surprisingly efficacious beneficial effect of dietary sodium exist and are discussed.

PMID: 16179484 [PubMed - indexed for MEDLINE]