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Protandim Decreases Plasma Osteopontin & Improves Markers of Oxidative Stress in Muscular Dystrophy.

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Dr. Brian Tseng and his colleagues at Massachusetts General Hospital, Harvard Medical School, and the University of Colorado Denver, demonstrated the ability of Protandim® to suppress levels of both oxidative stress and fibrosis, which can lead to heart failure and other symptoms exhibited in DMD, while increasing the activity of a protective antioxidant enzyme called paraoxonase-1 (PON1) in the mdx mouse model of DMD.

Abstract Summary: Therapeutic options for Duchenne muscular dystrophy (DMD), the most common and lethal neuromuscular disorder in children, remain elusive. Oxidative damage is implicated as a pertinent factor involved in its pathogenesis. Protandim® is an over-the-counter supplement with the ability to induce antioxidant enzymes. In this study we investigated whether Protandim® provided benefit using surrogate markers and functional measures in the dystrophin-deficient (*mdx*) mouse model of DMD. Male 3-week-old *mdx* mice were randomized into two treatment groups: control (receiving standard rodent chow) and Protandim supplemented standard rodent chow. The diets were continued for 6-week and 6-month studies. The endpoints included the oxidative stress marker thiobarbituric acid-reactive substances (TBARS), plasma osteopontin (OPN), plasma paraoxonase (PON1) activity, H&E histology, gadolinium enhanced magnetic resonance imaging (MRI) of leg muscle and motor functional measurements. The Protandim® chow diet in *mdx* mice for 6 months was safe and well tolerated. After 6 months of Protandim®, a 48% average decrease in plasma TBARS was seen; 0.92 nmol/mg protein in controls versus 0.48 nmol/mg protein in the Protandim® group (p = .006). At 6 months, plasma OPN was decreased by 57% (p = .001) in the Protandim®-treated mice. Protandim® increased the plasma antioxidant enzyme PON1 activity by 35% (p = .018). After 6 months, the *mdx* mice with Protandim® showed 38% less MRI signal abnormality (p = .07) than mice on control diet. In this 6-month *mdx* mouse study, Protandim® did not significantly alter motor function nor histological criteria.