Antibody Levels Correlate with Creatine Kinase Levels and Strength in Anti-HMG-CoA Reductase-Associated Autoimmune Myopathy

Andrew L. Mammen, Jessie Werner, Katherine Pak, Jordan E. Kus, Natalie R. Daya, Thomas E. Lloyd, Lisa Christopher-Stine, and Sharon R. Ghazarian

Objective. Anti-HMGCR antibodies are found in patients with statin-associated immune-mediated necrotizing myopathy and, less commonly, in statin-unexposed subjects with autoimmune myopathy. The association of antibody levels with disease activity has not been described.

Methods. Anti-HMGCR levels, creatine kinase (CK) levels, and strength were assessed. Associations of antibody level with CK and strength at visit 1 were analyzed in 55 subjects, 40 of whom were statin-exposed. In 12 statin-exposed and 5 statin-unexposed subjects with serum from 5 serial visits, the evolution of antibody levels, CK levels, and strength was investigated.

Results. Antibody levels were associated with CK levels (p < 0.001), arm strength (p < 0.05), and leg strength (p < 0.05) at visit 1 but these associations were only significant amongst statin-exposed patients in stratified analyses. Main effects for the full sample were found for decreased antibody levels (p < 0.05) and improved arm abduction strength (p < 0.05) with treatment over 26.2 +/- 12.6 months. Statin-exposed subjects who were followed longitudinally developed significantly decreased antibody levels (p < 0.01), decreased CK levels (p < 0.001), improved arm abduction strength (p < 0.05), and improved hip flexion strength (p < 0.05) with treatment. Anti-HMGCR antibody levels did not normalize in any subject.

Conclusion. In the entire cohort, initial anti-HMGCR levels correlated with indicators of disease activity; with treatment, antibody levels declined and arm strength improved over time. Statin-exposed but not statin-unexposed subjects had significant improvements in CK and strength, suggesting a phenotypic difference between statin-exposed and -unexposed anti-HMGCR patients.

This work was supported by NIH grant K08-AR-054783 (A.M.), K23-AR-053197 (L.C.-S.), and K08-NS062890 (T.L.). These studies were also supported by The Huayi and Siuling Zhang Discovery Fund, The Ira Fine Discovery Fund, and The Donald B. and Dorothy L. Stabler Foundation.

Andrew L. Mammen, M.D., Ph.D., Sharon R. Ghazarian, Ph.D., Jessie Werner, B.A., Katherine Pak, MD, Jordan E. Kus, Thomas Lloyd M.D., Ph.D., and Lisa Christopher-Stine, M.D., M.P.H.: Johns Hopkins University School of Medicine, Baltimore, MD. Natalie R. Daya, B.S., Emory University, Biostatistics and Bioinformatics Department, Atlanta, GA.