


appear to trigger or exacerbate myositis with anti-HMG-CoA reductase autoantibodies (5).

Taken together with the prior report (2), the clinical findings among subjects in the Gallup Indian Medical Center indicate that physicians should have a high index of suspicion for the development of autoimmune myopathy when prescribing statins to American Indian patients. Patients who develop muscle weakness and elevated creatinine kinase levels should be tested for anti-HMG-CoA reductase autoantibodies. In those who test positive, statins should be stopped and treatment initiated to improve muscle strength and prevent permanent muscle damage.

Supported in part by the Intramural Program of the National Institute of Arthritis and Musculoskeletal and Skin Diseases of the National Institutes of Health. Dr. Mammen is coinventor of a commercially available assay for anti-HMG-CoA reductase autoantibodies but receives no royalties or other compensation for this. The opinions expressed in this manuscript are those of the author(s) and do not necessarily reflect the views of the Indian Health Service.

Author disclosures are available at <https://onlinelibrary.wiley.com/action/downloadSupplement?doi=10.1002%2Fart.42126&file=art42126-sup-0001-Disclosureform.pdf>.

Jennie Wei, MD, MPH
Elizabeth Ketner, MD
Gallup Indian Medical Center
Gallup, NM
Andrew L. Mammen, MD, PhD 
andrew.mammen@nih.gov
National Institutes of Health
Bethesda, MD

- Mammen AL. Statin-associated autoimmune myopathy. *N Engl J Med* 2016;374:664–9.
- Close RM, Close LM, Galdun P, Gerstberger S, Rydberg M, Christopher-Stine L. Potential implications of six American Indian patients with myopathy, statin exposure and anti-HMGCR antibodies. *Rheumatology (Oxford)* 2021;60:692–8.
- Allenbach Y, Mammen AL, Benveniste O, Stenzel W, Immune-Mediated Necrotizing Myopathies Working Group. 224th ENMC International Workshop: clinico-sero-pathological classification of immune-mediated necrotizing myopathies Zandvoort, The Netherlands, 14–16 October 2016. *Neuromuscul Disord* 2018;28:87–99.
- Mammen AL, Gaudet D, Brisson D, Christopher-Stine L, Lloyd TE, Leffell MS, et al. Increased frequency of DRB1*11:01 in anti-HMG-CoA reductase-associated autoimmune myopathy. *Arthritis Care Res (Hoboken)* 2012;64:1233–7.
- Tiniakou E, Rivera E, Mammen AL, Christopher-Stine L. Use of proprotein convertase subtilisin/kexin type 9 (PCSK9) inhibitors in statin-associated immune-mediated necrotizing myopathy: a case series. *Arthritis Rheumatol* 2019;71:1723–6.

DOI 10.1002/art.42142



von Willebrand factor as an indicator of endothelial injury in COVID-19: comment on the article by Shi et al

To the Editor:

We read with great interest the article by Dr. Shi et al (1) on their efforts to “identify circulating factors contributing to endothelial cell activation and dysfunction in COVID-19.” Conspicuous by its

absence in this otherwise thorough investigation was any mention of von Willebrand factor (vWF), a coagulation factor and early indicator of endothelial injury (2). Increases in circulating vWF antigen precede and directly promote thrombosis by mediating platelet adhesion and preventing clearance of coagulation factor VIII (3). Shi and colleagues postulated that antiphospholipid antibodies may activate endothelial cells in COVID-19, which others have shown to be mediated by vWF (4). Patients with COVID-19 commonly have increased levels of vWF antigen, and its presence is a marker that could be used to predict the risk of death and increased length of hospitalization in patients with COVID-19 (5–9).

Author disclosures are available at <https://onlinelibrary.wiley.com/action/downloadSupplement?doi=10.1002%2Fart.42142&file=art42142-sup-0001-Disclosureform.pdf>.

Darryl E. Palmer-Toy, MD, PhD 
darryl.e.palmer-toy@kp.org
Timothy M. Cotter, MD
Hedyeh Shafi, MD
Su-Jau T. Yang, PhD
Alexander H. Cotter, BS 
Southern California Permanente Medical Group
North Hollywood, CA

- Shi H, Zuo Y, Navaz S, Harbaugh A, Hoy CK, Gandhi AA, et al. Endothelial cell-activating antibodies in COVID-19. *Arthritis Rheumatol* 2022;74:1132–8.
- Brogan P, Eleftheriou D. Vasculitis update: pathogenesis and biomarkers. *Pediatr Nephrol* 2018;33:187–98.
- Ruggeri ZM. Von Willebrand factor, platelets and endothelial cell interactions. *J Thromb Haemost* 2003;1:1335–42.
- Huang S, Ninivaggi M, Chayoua W, de Laat B. WVF, Platelets and the antiphospholipid syndrome. *Int J Mol Sci* 2021;22:4200.
- Cotter AH, Yang ST, Shafi H, Cotter TM, Palmer-Toy DE. Elevated von Willebrand factor antigen is an early predictor of mortality and prolonged length of stay for coronavirus disease 2019 (COVID-19) inpatients. *Arch Pathol Lab Med* 2022;146:34–7.
- Escher R, Breakey N, Lämmle B. ADAMTS13 activity, von Willebrand factor, factor VIII and D-dimers in COVID-19 inpatients. *Thromb Res* 2020;192:174–5.
- Helms J, Tacquard C, Severac F, Leonard-Lorant I, Ohana M, Delabranche X, et al. High risk of thrombosis in patients with severe SARS-CoV-2 infection: a multicenter prospective cohort study. *Intensive Care Med* 2020;46:1089–98.
- Philippe A, Chocron R, Gendron N, Bory O, Beauvais A, Peron N, et al. Circulating Von Willebrand factor and high molecular weight multimers as markers of endothelial injury predict COVID-19 in-hospital mortality. *Angiogenesis* 2021;24:505–17.
- Marco A, Marco P. Von Willebrand factor and ADAMTS13 activity as clinical severity markers in patients with COVID-19. *J Thromb Thrombolysis* 2021;52:497–503.

DOI 10.1002/art.42141

Reply

To the Editor:

We appreciate Dr. Palmer-Toy et al's interest in our article. We agree that vWF is an important mediator of