AAN.COM(HTTPS://WWW.AAN.COM/)

AAN PUBLICATIONS





November 24, 2009; 73 (21) ARTICLES

The Microbleed Anatomical Rating Scale (MARS)

Reliability of a tool to map brain microbleeds

S. M. Gregoire, U. J. Chaudhary, M. M. Brown, T. A. Yousry, C. Kallis, H. R. Jäger, D. J. Werring First published November 23, 2009, DOI: https://doi.org/10.1212/WNL.0b013e3181c34a7d

| ≛ FULL PDF | 66 CITATION | | ₽ PERMISSIONS |
|--------------|-------------|-----------------------|---------------|
| MAKE COMMENT | | → SEE COMMENTS | |



Add to Cart (\$39)

SHARE

☑ f **୬** in

Article

Figures & Data

Info & Disclosures

Abstract

Objective: Brain microbleeds on gradient-recalled echo (GRE) T2*-weighted MRI may be a useful biomarker for bleeding-prone small vessel diseases, with potential relevance for diagnosis, prognosis (especially for antithrombotic-related bleeding risk), and understanding mechanisms of symptoms, including cognitive impairment. To address these questions, it is necessary to reliably measure their presence and distribution in the brain. We designed and systematically validated the Microbleed Anatomical Rating Scale (MARS). We measured intrarater and interrater agreement for presence, number, and anatomical distribution of microbleeds using MARS across different MRI sequences and levels of observer experience.

Methods: We studied a population of 301 unselected consecutive patients admitted to our stroke unit using 2 GRE T2*-weighted MRI sequences (echo time [TE] 40 and 26 ms). Two independent raters with different MRI rating expertise identified, counted, and anatomically categorized microbleeds.

Results: At TE = 40 ms, agreement for microbleed presence in any brain location was good to very good (intrarater $\kappa = 0.85$ [95% confidence interval (CI) 0.77–0.93]; interrater $\kappa = 0.68$ [95% CI 0.58–0.78]). Good to very good agreement was reached for the presence of microbleeds in each anatomical region and in individual cerebral lobes. Intrarater and interrater reliability for the number of microbleeds was excellent (intraclass correlation coefficient [ICC] = 0.98 [95% CI 0.97–0.99] and ICC = 0.93 [0.91–0.94]). Very good interrater reliability was obtained at TE = 26 ms ($\kappa = 0.87$ [95% CI 0.61–1]) for definite microbleeds in any location.

Conclusion: The Microbleed Anatomical Rating Scale has good intrarater and interrater reliability for the presence of definite microbleeds in all brain locations when applied to different MRI sequences and levels of observer experience.

Glossary

BOMBS = Brain Observer Microbleed Scale; **CAA** = cerebral amyloid angiopathy; **CI** = confidence interval; **DPWM** = deep and periventricular white matter; **FA** = flip angle; **FLAIR** = fluid-attenuated inversion recovery; **FOV** = field of view; **GRE** = gradient-recalled echo; **ICC** = intraclass correlation coefficient; **MARS** = Microbleed Anatomical Rating Scale;

NEX = number of excitations; **NHNN** = National Hospital for Neurology and Neurosurgery;

TE = echo time; TR = repetition time.

View Full Text

Letters: Rapid online correspondence

No comments have been published for this article.



YOU MAY ALSO BE INTERESTED IN

MAY 8, 2019

The Inverse Relationship Between Cerebral Microbleed Burden and Migraine-Related Disability in CADASIL (S40.004)

Eric Goldstein, Mohammed Badi, James Klaas, et al. April 16, 2019

ARTICLE

Recurrent stroke risk and cerebral microbleed burden in ischemic stroke and TIA A meta-analysis

Duncan Wilson, Andreas Charidimou, Gareth Ambler, et al. September 02, 2016

RESEARCH ARTICLE

Prevalence and Risk Factors of Cerebral Microbleeds Analysis From the UK Biobank

Dongwei Lu, Junfeng Liu, Andrew D. MacKinnon, et al. August 18, 2021

SATURDAY, APRIL 25

Prevalence of Cerebral Microbleeds in Patients with Idiopathic Normal Pressure Hydrocephalus and their Impact on Post-Shunt Outcome (2427)

Lukas Sveikata, Alma Lingenberg, Tiberiu Laticevschi, et al. April 14, 2020

MARCH 21,2013

Contribution of Intracranial Large Vessel Stenosis and Small Vessel Ischemia to Post-Stroke Cognitive Impairment in an Asian Population (P06.063)

Xuling Lin, Nishini Hekha, Amanda Ng, et al. February 08, 2016

▲ Back to top



HASTENING THE DIAGNOSIS OF AMYOTROPHIC LATERAL SCLEROSIS

Dr. Brian Callaghan and Dr. Kellen Quigg

► WATCH

TOPICS DISCUSSED

All Cerebrovascular disease/Stroke

MRI

Intracerebral hemorrhage

ALERT ME

Alert me when eletters are published

RECOMMENDED ARTICLES

ARTICLE

Detection of Cerebral Microbleeds With Venous Connection at 7-Tesla MRI

Johanna Rotta, Valentina Perosa, Renat Yakupov et al.

Neurology, March 02, 2021

ARTICLES

Rapid appearance of new cerebral microbleeds after acute ischemic stroke

S. -B. Jeon, S. U. Kwon, A. -H. Cho et al.

Neurology, September 16, 2009

ARTICLES

Microbleeds do not affect rate of cognitive decline in Alzheimer disease

Annelies E. van der Vlies, Jeroen D.C. Goos, Frederik Barkhof et al.

Neurology, August 08, 2012

ARTICLES

Cerebral microbleeds are a risk factor for warfarin-related intracerebral hemorrhage

Seung-Hoon Lee, Wi-Sun Ryu, Jae-Kyu Roh et al. Neurology, January 12, 2009



Articles

Ahead of Print

Current Issue

Past Issues

Popular Articles

Translations

About

About the Journals

Ethics Policies

Editors & Editorial Board

Contact Us

Advertise

Submit

Author Center

Submit a Manuscript

Information for Reviewers

AAN Guidelines

Permissions

Subscribers

Subscribe

Activate a Subscription

Sign up for eAlerts

RSS Feed







Neurology

Neurology: Clinical Practice

Neurology: Education

Neurology: Genetics

Neurology: Neuroimmunology & Neuroinflammation

AAN.com

Continuum

Brain & Life

Neurology Today





Neurology | Print ISSN:0028-3878 Online ISSN:1526-632X © 2023 American Academy of Neurology

Privacy Policy Feedback Advertise