Your abstract/proposal submission has been received

Print this page

You have submitted the following abstract/proposal to Alzheimer's Association International Conference. Receipt of this notice does not guarantee that your submission was complete or free of errors.

Investigating white matter hyperintensities in a multicenter COVID-19 study using 7T MRI

Jinghang Li, BS[1], Jr-Jiun Liou, PhD[1], Tales Santini, PhD[1], Salem Alkateeb, MS[1], Oluwatobi F Adeyemi[2], Gabriel A. de Erausquin, MD, PhD[3], Valentina R. Garbarino, PhD[3], Monica Goss, PhD[3], Mohamad Habes, PhD[3], Jayandra Jung Himali, PhD[3], Christof Karmonik, PhD[4], Karl Li, MD, PhD[3], Joseph C. Masdeu, MD, PhD[4], Rejani R Nair, BSN[4], Vibhuti N Patel[3], Beth E. Snitz, PhD[1], Howard J Aizenstein, MD, PhD[1], Minjie Wu, PhD[1], Richard Bowtell, PhD[2], Gowland Penny, PhD[2], Gustavo C Roman, MD, PhD[4], Mary Ganguli, MD, MPH[1], Farhaan S Vahidy, PhD, MBBS, MPH, FAHA[4], Timothy D. Girard, MD, PhD[1], Heidi I.L. Jacobs, PhD[5,6], Akram A. Hosseini, PhD, MD[7], Sudha Seshadri, MD[3] and Tamer Ibrahim, PhD[1], (1)University of Pittsburgh, Pittsburgh, PA, USA, (2)Sir Peter Mansfield Imaging Centre, University of Nottingham, Nottingham, United Kingdom, (3)University of Texas Health San Antonio, San Antonio, TX, USA, (4)Houston Methodist Research Institute, Houston, TX, USA, (5)Massachusetts General Hospital, Boston, MA, USA, (6)Gordon Center for Medical Imaging, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA, (7)Nottingham University Hospitals NHS Trust, Queens Medical Center, Nottingham, United Kingdom

Abstract Text:

Background:

Emerging evidence indicates that COVID-19 can negatively impact patient's brain health (Douaud et al., 2022) (Cecchetti et al., 2022). Common clinical symptoms include brain fog, headaches, difficulty concentrating, and loss of sense of smell or taste. Some studies suggest that SARS-CoV-2 infection can damage the blood brain barrier either directly or through immune-inflammatory mechanisms (Zhang, et al. 2021). White matter hyperintensities (WMH) are imaging biomarkers of brain vascular or inflammatory injury. We investigated the association between severity of COVID-19 infection and burden of white matter hyperintensity volumes within a diverse multi-nation, multi-racial cohort using 7 Tesla (7T) MRI that can detect more subtle injury than conventional 1.5 or 3T MRI.

Method:

Participants were recruited at 4 sites: Pittsburgh, San Antonio and Houston, USA, and Nottingham, UK. To date, we have scanned and included the following participants in our analysis (Table 1). Detailed cognitive, neurological, mood and functional assessments and high-resolution MRI scans were collected. Subsequent WMH segmentation was performed using our in-house built deep learning based model (Figure 1). All segmentations were visually inspected and manually corrected before statistical analysis. Normalized WMH is calculated as a ratio of the WMH volume and the intracranial volume (WMH/ICV). Imaging data for an additional 36 age-matched controls were retrieved from the 7 Tesla Bioengineering Research Program (7TBRP) imaging bank at Pittsburgh.

Result:

Figure 1 shows the WMH segmentation outputs from our deep learning based model on images acquired at the 3 sites. Our Linear regression models along with our non-parametric Kruskal-Wallis test result suggests that compared to mild COVID cases and healthy control, COVID infected individuals that were ICU admitted show elevated WMH burden (Figure 2).

Conclusion:

Our results demonstrate that white matter hyperintensity volumes were higher among patients who had severe acute COVID infection that required ICU admission, compared to healthy age-matched controls. In contrast, no difference in white matter burden was observed in patients with mild COVID infection compared to healthy controls. Additional data (both cross-sectional and longitudinal), including more

sensitive MRI measures is being collected to define the full spectrum of brain injury associated with sequelae of COVID infection.
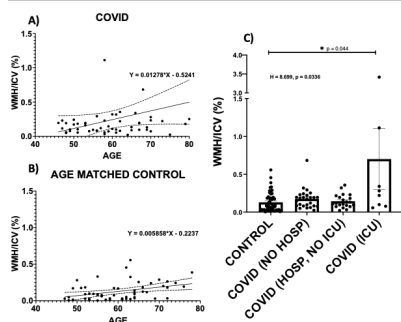
Tables and Figures:

AAIC_Table1.png (46.4KB)

Imaging site	Age-matched Control	COVID non-hospitalized	COVID Hospitalized (no ICU admission)	COVID (ICU admission)
Pittsburgh	N = 36	N = 0	N = 11	N = 6
Texas	N = 9	N = 11	N = 11	N = 2
Nottingham	N= 11	N = 14	N = 0	N = 0
Age (average)	60 y.o.	58 y.o.	60 y.o.	62 y.o.

AAIC_Figure1.png (305.6KB)
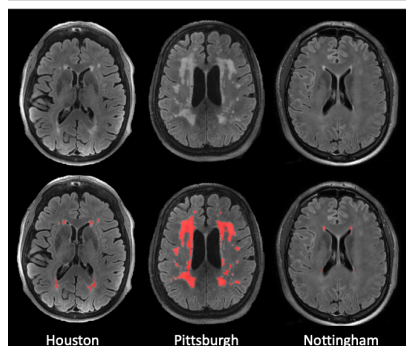
AAIC_Figure2.png (52.4KB)

Title:
Investigating white matter hyperintensities in a multicenter COVID-19 study using 7T MRI

Submitter's E-mail Address:
jil202@pitt.edu

Electronic Signature:
Jinghang Li

Preferred Presentation Format:
Oral Presentation Preferred, but will do Poster Presentation if so assigned

Preferred Presentation Method:
In-Person

Was this research funded by an Alzheimer's Association grant?
No

Abstract Submission Affirmations:
I agree to the Abstract Submission Affirmations.

Do you plan to upload figures or tables to supplement your abstract text?
Yes

Theme:
Biomarkers

Topic:
Neuroimaging

Sub Topic:
Optimal neuroimaging measures for tracking disease progression

Learning Objectives:

Investigate the relation between the severity of COVID-19 infection and patients' white matter hyperintensity burden

Assemble a broader perspective of COVID-19 infection on brain health within a diverse multi-site, multi-racial cohort

Keywords:
COVID-19, magnetic resonance imaging (MRI) and white matter disease

First Presenting Author

Presenting Author

Jinghang Li, BS
Email: jil202@pitt.edu

University of Pittsburgh
Pittsburgh PA 15260
USA

Any relevant financial relationships? No
Signed on 04/24/2023 by *Jinghang Li*

Second Author

Jr-Jiun Liou, PhD
Email: JRL189@pitt.edu

University of Pittsburgh
Pittsburgh PA
USA

Third Author

Tales Santini, PhD
Email: santini.tales@pitt.edu

University of Pittsburgh
Pittsburgh PA 15213
USA

Fourth Author

Salem Alkateeb, MS
Email: saa194@pitt.edu

University of Pittsburgh
Pittsburgh PA
USA
University of Pittsburgh
Pittsburgh PA
USA

Fifth Author

Oluwatobi Adeyemi
Email: oluwatobi.adeyemi@nottingham.ac.uk

Sir Peter Mansfield Imaging Centre, University of Nottingham
Nottingham
United Kingdom

Sixth Author

Gabriel de Erausquin, MD, PhD
Email: deerausquing@uthscsa.edu

University of Texas Health San Antonio
San Antonio TX 78229
USA

Seventh Author

Valentina Garbarino, PhD
Email: garbarino@uthscsa.edu

University of Texas Health San Antonio
San Antonio TX 78229

USA

Eighth Author

Monica Goss, PhD
Email: gossm@uthscsa.edu

University of Texas Health San Antonio
San Antonio TX
USA

Ninth Author

Mohamad Habes, PhD
Email: habes@uthscsa.edu

University of Texas Health San Antonio
San Antonio TX 78229
USA

Tenth Author

Jayandra Himali, PhD
Email: himali@uthscsa.edu

University of Texas Health San Antonio
San Antonio TX
USA

Eleventh Author

Christof Karmonik, PhD
Email: CKarmonik@houstonmethodist.org

Houston Methodist Research Institute
Houston TX
USA

Twelfth Author

Karl Li, MD, PhD
Email: lik@uthscsa.edu

University of Texas Health San Antonio
San Antonio TX
USA

Thirteenth Author

Joseph Masdeu, MD, PhD
Email: jcmasdeu@houstonmethodist.org

Houston Methodist Research Institute
Houston TX
USA

Fourteenth Author

Rejani Nair, BSN
Email: rrnair@houstonmethodist.org

Houston Methodist Research Institute
Houston TX
USA

Fifteenth Author

Vibhuti Patel
Email: patelv1@uthscsa.edu

University of Texas Health San Antonio
San Antonio TX
USA

Sixteenth Author

Beth Snitz, PhD
Email: snitbe@upmc.edu

University of Pittsburgh
Pittsburgh PA 15213
USA

Seventeenth Author

Howard Aizenstein, MD, PhD
Email: aizensteinhj@upmc.edu

University of Pittsburgh
Pittsburgh PA
USA

Eighteenth Author

Minjie Wu, PhD
Email: MIW75@pitt.edu

University of Pittsburgh
Pittsburgh PA 15213
USA

Nineteenth Author

Richard Bowtell, PhD
Email: richard.bowtell@nottingham.ac.uk

Sir Peter Mansfield Imaging Centre, University of Nottingham
Nottingham
United Kingdom

Twentieth Author

Gowland Penny, PhD
Email: penny.gowland@nottingham.ac.uk

Sir Peter Mansfield Imaging Centre, University of Nottingham
Nottingham
United Kingdom

Twenty-first Author

Gustavo Roman, MD, PhD
Email: GCRoman@houstonmethodist.org

Houston Methodist Research Institute
Houston TX
USA

Twenty-second Author

Mary Ganguli, MD, MPH
Email: gangulim@upmc.edu

University of Pittsburgh
Pittsburgh PA 15213
USA

Twenty-third Author

Farhaan Vahidy, PhD, MBBS, MPH, FAHA
Email: fvahidy@houstonmethodist.org

Houston Methodist Research Institute
Houston TX 77030
USA

Twenty-fourth Author

Timothy D. Girard, MD, PhD
Email: timothy.girard@pitt.edu

University of Pittsburgh
Pittsburgh PA
USA

Twenty-fifth Author

Heidi Jacobs, PhD
Email: hjacobs@mgh.harvard.edu

Massachusetts General Hospital
Boston MA 02114
USA
Gordon Center for Medical Imaging, Massachusetts General Hospital, Harvard Medical School
Boston MA 02114
USA

Twenty-sixth Author

Akram Hosseini, PhD, MD
Email: ahosseini@doctors.org.uk

Nottingham University Hospitals NHS Trust, Queens Medical Center
Nottingham NG7 2UH
United Kingdom

Twenty-seventh Author

Sudha Seshadri, MD
Email: Seshadri@uthscsa.edu

University of Texas Health San Antonio
San Antonio TX 78229
USA

Twenty-eighth Author

Tamer Ibrahim, PhD
Email: tibrahim@pitt.edu

University of Pittsburgh
Pittsburgh PA 15213
USA

If necessary, you can make changes to your abstract/proposal submission

> To access your submission in the future, use the direct link to your abstract/proposal submission from one of the automatic confirmation emails that were sent to you during the submission.
> *Or* point your browser to /alz/reminder.cgi to have that URL mailed to you again. Your username/password are 83186/875368.

Any changes that you make will be reflected instantly in what is seen by the reviewers. You DO NOT need to go through all of the submission steps in order to change one thing. If you want to change the title, for example, just click "Title" in the abstract/proposal control panel and submit the new title.

When you have completed your submission, you may close this browser window.

Tell us what you think of the abstract/proposal submission process

Home Page