School of Medicine Publications and Presentations

School of Medicine

7-17-2023

Hippocampal subfield volumes in COVID-19: a preliminary multicenter study using 7T MRI

Salem Alkateeb

Jinghang Li

Gabriel A. de Erausquin
University of Texas Health Science - San Antonio

Monica Goss

Jayandra J. Himali

See next page for additional authors

Recommended Citation

Santini, T., Alkateeb, S., Liou, J.-J., Li, J., Adeyemi, O. F., Erausquin, G. A. de, Garbarino, V. R., Goss, M., Habes, M., Himali, J. J., Karmonik, C., Li, K., Masdeu, J. C., Nair, R. R., Patel, V. N., Snitz, B. E., Bowtell, R., Penny, G., Roman, G. C., … Ibrahim, T. (2023, July 17). Hippocampal subfield volumes in COVID-19: A preliminary multicenter study using 7T MRI. Alzheimer's Association International Conference. https://alz.confex.com/alz/2023/meetingapp.cgi/Paper/82651

Authors

Salem Alkateeb, Jinghang Li, Gabriel A. de Erausquin, Monica Goss, Jayandra J. Himali, Karl Li, Rejani R. Nair, Beth E. Snitz, Gowland Penny, and Valentina R. Garbarino

Hippocampal subfield volumes in COVID-19: a preliminary multicenter study using 7T MRI

📅 Monday, July 17, 2023

🕐 1:00 AM - 1:45 AM

📍 *Hall 11 (RAI Amsterdam Convention Centre)*

Theme

Biomarkers

Abstract

Background*: Hippocampal formation atrophy is a well-established imaging biomarker of several neurological diseases, including Alzheimer's disease, temporal lobe epilepsy, and schizophrenia. The hippocampus is divided into subfields that have different functions and vary in sensitivity to different diseases. This study investigates the potential interaction between COVID-19 and the various hippocampus subfields, which may shed light on the long-term neurological consequences of the virus.

Method: We obtained high-resolution T1-weighted (T1w) and T2-weighted (T2w) MRI images using 7T scanners located at three sites in two countries: Pittsburgh (n=14) and Texas (San Antonio and Houston) (n=40) in the USA, and Nottingham, UK (n=33). We evaluated the hippocampus subfields using the ASHS package [1-3]. Imaging sets of 51 subjects with minimal or no manual segmentation corrections (Figures 1 and 2) were included in the analysis. We conducted T-tests with Bonferroni correction, adjusting for age and intracranial volume to identify the differences in hippocampus subfield volumes across groups.

Result: Participants who needed admission into the ICU due to Covid-19 showed a significantly lower (p-value=0.0034) left CA1 volume compared to participants who did not require ICU (Figure 3). In addition, several other non-significant trends were observed.

Conclusion: Our preliminary findings suggest that Covid-19 may impact the hippocampus, particularly in patients who required intensive care. However, the study - as of to date - has a small sample size and lacks a comparison group with patients who were admitted into ICU for acute illnesses other than Covid-19. Additionally, longitudinal data is needed to track the long-term effects of the disease on the hippocampal subfields.

References: 1. Berron et al. Neuroimage 2017 2. Yushkevich et al. Human Brain Mapping 2015 3. Santini et al. Neuroimage: clinical 2021

Presenting Author

Tales Santini
University of Pittsburgh

Authors

Salem Alkateeb
University of Pittsburgh

Jr-Jiun Liou
University of Pittsburgh

Jinghang Li
University of Pittsburgh

Oluwatobi F Adeyemi
Sir Peter Mansfield Imaging Centre, University of Nottingham

Gabriel A. de Erausquin
Glenn Biggs Institute for Alzheimer's & Neurodegenerative Diseases, University of Texas Health Science Center

Valentina R. Garbarino
Glenn Biggs Institute for Alzheimer's & Neurodegenerative Diseases, University of Texas Health Science Center

Monica Goss
Glenn Biggs Institute for Alzheimer's & Neurodegenerative Diseases, UT Health San Antonio

Mohamad Habes
University of Texas Health San Antonio

Jayandra Jung Himali
University of Texas Health San Antonio

Christof Karmonik
Houston Methodist Research Institute

Karl Li

Joseph C. Masdeu

University of Texas Health San
Antonio

Rejani R Nair
Houston Methodist Research
Institute

Beth E. Snitz
University of Pittsburgh

Gowland Penny
Sir Peter Mansfield Imaging
Centre, University of
Nottingham

Mary Ganguli
University of Pittsburgh

Timothy D. Girard
University of Pittsburgh

Akram A. Hosseini
Nottingham University
Hospitals NHS Trust, Queens
Medical Center

Tamer Ibrahim
University of Pittsburgh

Houston Methodist Research
Institute

Vibhuti N Patel
University of Texas Health San
Antonio

Richard Bowtell
Sir Peter Mansfield Imaging
Centre, University of
Nottingham

Gustavo C Roman
Houston Methodist Research
Institute

Farhaan S Vahidy
Houston Methodist Research
Institute

Heidi I.L. Jacobs
Massachusetts General
Hospital

Sudha Seshadri
University of Texas Health San
Antonio

Fig1.png	Download
Fig2.png	Download
Fig3.png	Download

View Related