nodes in the DMN with spatial precision. The present open-label, single group study assessed whether tFUS to a hub of the DMN, the anterior medial prefrontal cortex, reduces depressive symptoms, and whether changes in DMN connectivity will track changes in symptom severity. Twenty depressed participants completed up to three weeks of tFUS targeting the anterior medial prefrontal cortex, with depression severity assessed using the Beck Depression Inventory – II before and after the course of treatment. Nineteen were included in the final MRI analysis. Changes in resting-state functional connectivity within the DMN (between the right prefrontal cortex and bilateral retrosplenial cortex) were associated with changes in symptom severity, with greater decreases in depression symptoms associated with greater reductions in DMN connectivity. These findings support the important role of the DMN in depression and demonstrate the promise of transcranial ultrasound as an effective and fast-acting intervention when targeting the DMN.

FUNDING: John J.B. Allen received an investigator-initiated grant from Openwater.

Topics: 1.4 Human Studies: Clinical Samples- Adults, 2.1 Neuroimaging (EEG, fMRI, fNIRS etc.), 2.18 Brain stimulation, 3.6 Other (open-label case series), 4.7 Psychopathology

POSTER SESSION III-095 | IMPACT OF OPTIMIZING MORLET WAVELET TRANSFORM PARAMETERS ON DEEP NEURAL NETWORKS FOR ELECTROCARDIOGRAM SIGNAL CLASSIFICATION

Siamak Mirifar, Markus Stichler
Technische Hochschule Rosenheim, Rosenheim, Germany

Electrocardiogram signals reveal critical insights into psychophysiological processes. This study focuses on introducing a novel approach to Electrocardiogram signal classification leveraging wavelet transforms combined with deep learning methodologies. This research classifies Electrocardiogram signals (N=60; 3*20 per group) into three critical categories: Arrhythmia, Normal Sinus Rhythm, and Congestive Heart Failure. The study employed optimized continuous wavelet transforms for feature extraction, capturing both time and frequency information from Electrocardiogram signals. Subsequently, a deep learning model was developed and optimized demonstrating the feasibility of deploying advanced machine learning model for diagnostics on low-power, portable devices. The Deep learning neural network has three 2D convolution layers, and three dense layers, in which model is trained by grey scale datasets. Results indicate (1) a significant improvement in efficiency, with data processing time decreased by a factor of 10; (2) the model classification accuracy was excellent with test accuracy of 99.1%, validation accuracy of 99.5%, and train accuracy of 99.0%, showcasing the potential of this approach for more robust analysis of Electrocardiogram signals with respect to the time efficiency. These results add to the understanding the Electrocardiogram signal by advancing signal processing techniques and may be of assistance to real-world applications in remote health monitoring and diagnostic systems.

Topics: 1.4 Human Studies: Clinical Samples- Adults, 2.3 Cardio (HR, HRV, LVET, PEP), 2.17 Machine Learning/ Deep Learning, 3.1 Observational Study: Cross-Sectional, 4.5 Population-specific health, 4.26 Other

POSTER SESSION III-096 | HEART RATE VARIABILITY FOLLOWING COMBAT INJURY IN BRITISH MILITARY SERVICEMEN- IS THERE AN ASSOCIATION?

Rabeea Maqsood[1], Susie Schofield[2], Alexander Bennett[2,3], Ahmed Khattab[1], Anthony Bull[2], Nicola Fear[4], Christopher Boos[1,5]
[1]Bournemouth University, Bournemouth, United Kingdom, [2]Imperial College London, London, United Kingdom, [3]Defence Medical Rehabilitation Centre, Loughborough, United Kingdom, [4]King's College London, London, United Kingdom, [5]University Hospitals Dorset, Poole Hospital, Poole, United Kingdom

Combat-related traumatic injury (CRTI) can adversely affect psychophysiological well-being. The association between CRTI and short-term heart rate variability (HRV) remains unexamined within a military cohort and was the aim of this study. This study (n=975) undertook the analysis of the first follow-up data from the ArmeD serVices trAuma rehabilitatioN outComE (ADVANCE) cohort study, UK. The participants were frequency-matched (age, rank, role-in-theatre, and deployment period: Afghanistan 2003-2014) at recruitment and were divided into injured and uninjured groups. HRV data were acquired using a 5-minute electrocardiogram with participants breathing normally in a supine and fully-rested state. Root-mean-square-of-successive-differences (RMSSD) was reported to measure parasympathetic tone (HRV). A multiple regression model was run to report the CRTI-RMSSD association, adjusting for age, rank, and ethnicity. Participants' median age was 37.5 (IQR 34.2, 41.2) years. Of 975 participants, 469 had CRTI whereas 506 were uninjured. The time since injury/deployment was approximately 11 years. Median RMSSD was significantly lower in injured than uninjured [37.7ms, (IQR 25.3,

55.9) vs 41.9ms (IQR 27.7, 62.2); p<0.05]. An 8% reduction in the geometric mean of RMSSD was observed relating to CRTI after confounder adjustment (Geometric Mean Ratio: 0.92 (95%CI:0.85,0.99);p<0.05). The findings indicate that even several years past, the CRTI associates with lower parasympathetic tone in injured than uninjured servicemen. Our findings may help understand the recovery pathway following CRTI.

FUNDING: This study is a part of RM's PhD studentship- jointly funded by Bournemouth University and the ADVANCE charity, UK. The ADVANCE study is funded through the ADVANCE Charity. Key contributors to this charity are the Headley Court Charity (principal funder), HM Treasury (LIBOR Grant), Help for Heroes, Nuffield Trust for the Forces of the Crown, Forces in Mind Trust, National Lottery Community Fund, Blesma - The Limbless Veterans and the UK Ministry of Defence.

Topics: 1.8 Other (Human Studies: Military veterans and personnel (with combat injury and without combat injury)), 2.3 Cardio (HR, HRV, LVET, PEP), 2.5 Hemodynamic (BP), 2.11 Questionnaires/Interviews, 3.1 Observational Study: Cross-Sectional, 4.5 Population-specific health, 4.15 Biofeedback, 4.26 Other

POSTER SESSION III-097 | ISOLATING THE KONIOCELLULAR CONTRIBUTION TO AVERSIVE LEARNING IN HUMAN VISUAL CORTEX

Katherine McCain[1], Nathan Petro[2], Andreas Keil[1]
[1]University of Florida, Gainesville, FL, USA, [2]Institute for Human Neuroscience, Boys Town National Research Hospital, Boys Town, NE, USA

Steady-state visual evoked potentials (ssVEPs) have been instrumental in characterizing the neurophysiology of the human visual system. The tritanopic technique leverages the selective activation of short-wave cones to isolate one of three major retino-cortical streams—the koniocellular pathway. This pathway has been hypothesized to support the early detection of threat cues based on animal-model work, but this notion is still to be tested in humans. The present study (n=40) used a differential aversive conditioning task with tritan and luminance stimuli, measuring ssVEPs and pupil diameter. Trials included a pre-stimulus adaptor period containing a central fixation point over a uniform yellow background (tritan condition) or a uniform black background (luminance condition). Following the adaptor, a white grating was superimposed on the adaptor and flickered at a frequency of 7.5 Hz. The grating was oriented at 45 or 135 degrees, signaling the presence (CS+) or absence (CS-) of the unconditioned stimulus (electric shock). Tritan stimuli elicited more robust ssVEPs than luminance stimuli. This effect increased during the acquisition phase, aligning with the idea that arousal influences koniocellular processing. Pupil diameter decreased after tritan adaptor presentation; the subsequent pupil re-dilation was greater for CS+ cues than CS- in both the tritan and luminance conditions. Findings replicate work showing heightened ssVEP responses to tritan stimuli and align with theories suggesting that the koniocellular pathway plays a role in processing emotional significance.

FUNDING: Research was supported by NIH grant R01MH125615 to Dr. Andreas Keil.

Topics: 1.1 Human Studies: General Population - Adults, 2.1 Neuroimaging (EEG, fMRI, fNIRS etc.), 2.6 Eye Tracking (blink, movement, size), 2.13 Behavioral Tasks (e.g. stress exposure), 3.3 Lab Based Experiment, 4.22 Learning/conditioning, 4.26 Other

POSTER SESSION III-098 | CORTISOL AND LONG-TERM STRESS ASSOCIATED WITH CHRONIC PAIN INDUCE AN ADAPTATION OF HEMODYNAMIC REGULATION TO DOMINANT VASCULAR INFLUENCES

Gustavo Reyes del Paso[1], Elisabeth Ruiz-Padial[1], Casanfra Montoro-Aguilar[1], Ailyn Garcia-Hernandez[1], Stefan Duschek[2]
[1]University of Jaén, Jaén, Spain, [2]University for Health Sciences, Medical Informatics and Technology, Hall, Austria

Exposure to long-lasting laboratory stressors lead to a rearrangement of cardiovascular control, with a shift of regulation from dominant cardiac to dominant vascular influences. This study investigated whether this change also occurs during life stress accompanying chronic pain and analyzed associations between cortisol and cardiovascular variables in patients with fibromyalgia (FM). In women with FM and healthy women (HW), hair cortisol concentration (HCC) and cardiovascular recordings were taken during sitting, lying down and standing. FM patients showed higher levels of stress than HW. Severity and chronicity of FM were positively and negatively, respectively, associated with HCC. During standing (orthostatic challenge), FM patients showed higher total peripheral resistance (TPR) but lower stroke volume (SV) and cardiac output (CO) than HW. During sitting and lying down, TPR was more closely related to blood pressure (BP) than CO in FM patients; in contrast, CO was more closely related to BP than TPR in HW. HCC correlated positively with TPR and BP in FM patients, but negatively with TPR and BP and positively with SV and CO in HW. Results suggest that chronic pain-related stress