CONQUER CHIARI
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CCRC Researchers Find More Evidence On The Cognitive Impact Of Chiari

The Conquer Chiari Research Center (CCRC) has been at the forefront of studying the cognitive and emotional impact of Chiari. Using neuropsychological testing, they have shown that Chiari patients often exhibit deficits in executive function, working memory, attention, and visuospatial skills. Using diffusion tensor imaging, they also found that Chiari patients show structural damage in specific brain connections. Now, they have used a type of imaging known as resting state functional MRI, to show that Chiari patients have abnormal functional connections in specific areas of the brain. Functional MRI (fMRI) uses blood flow to identify levels of cognitive activity and functional networks in the brain. Often subjects are asked to perform a task during the scan. For example, if a person is focused on performing a language oriented task, then the MRI will show which parts of the brain are active to accomplish that task and how they are connected. If they are focused on a math related task, different parts of the brain will be active and different connections will show up on the scan. Resting state fMRI uses the same technique but subjects do not perform a task during the imaging. The result is the scan highlights which brain connections are active during a person's default, or resting state. For this study 18 adults with Chiari and 18 healthy controls underwent resting state functional MRI testing. In addition, they completed pain and attention assessments and a Chiari symptom questionnaire. Not surprisingly, the Chiari patients reported significantly more pain and showed deficits in attention, but in addition the resting state fMRI showed several significant differences between the groups. Many of the abnormal connections involved connections between the cerebellum and cerebrum. Using statistical techniques, the researchers found that some of the abnormal functional connections were likely due to chronic pain, while others were related to attention. Dr Allen, the lead cognitive researcher at the CCRC believes these findings support the idea that the chronic pain that many Chiari patients suffer from drains their neural resources (attention) resulting in cognitive deficits.

Source: Functional connectivity abnormalities in Type I Chiari: associations with cognition and pain. Houston ML, Houston JR, Sakaie K, Klinge PM, Vorster S, Luciano M, Loth F, Allen PA. Brain Commun. 2021 Jun 14;3(3).

Conquer Chiari's research updates highlight and summarize interesting publications from the medical literature while providing background and context. The summaries do contain some medical terminology and assume a general understanding of Chiari. Introductory information and many more research articles can be found at www.conquerchiari.org.