Key Points

1. Headache is the most common symptom associated with Chiari and patients suffer from a variety of them, including exertional headaches and migraines
2. The precise relationship between migraines and Chiari is not well understood
3. Study from Turkey looked at the characteristics of Chiari patients with migraines
4. Out of 73 total Chiari patients, 11 suffered from migraines, which is not much different from the general population
5. However, the frequency of chronic migraines was 3 times as high among the Chiari group
6. Researchers also compared the Chiari migraine group with general migraine sufferers
7. The Chiari group tended to have more migraines, greater pain, and more nausea and vomiting. Also, among the Chiari group, the patients were much younger when the migraines first started
8. The physiological link between Chiari and migraines is not known, but one theory of migraines does involve pain centers in the brain stem, which can be compressed with Chiari

Definitions

aura - symptom of a migraine in which a person sees flashing lights or has other visual disturbances

chronic migraine - migraines that occur 15 days or more per month

migraine - type of severe headache which often includes vision problems, nausea, and vomiting and tends to recur

suboccipital - beneath the occipital bone in the back of the head

Study Explores The Chiari-Migraine Connection

July 31, 2008 -- Headaches are the most common symptom associated with Chiari. Whether its throbbing in the back of the head (suboccipital), pressure behind the eyes, or brought on by coughing, crying, or singing, the majority - but not all - of Chiari patients suffer from some type of headache. One such headache which seems to be common among Chiari patients are migraines.

Migraines refer to severe headaches, which usually recur, and can include changes in vision (known as an aura). Unfortunately, when a person with migraines and Chiari seeks help from a doctor, the migraines can become the focus of treatment since they are more common. This can mask the underlying Chiari problem and delay an accurate diagnosis and treatment.

Although most Chiari experts would agree that there appears to be some type of connection between Chiari and migraines, the nature of that link is a complete unknown. Now, researchers from Turkey have published a study in the journal, Clinical Neurology and Neurosurgery which clearly demonstrates a link, but comes short of clarifying its precise nature.

The researchers identified 73 Chiari patient they had treated over a two year period. Chiari was defined as a malformation of at least 5 mm on MRI, or at least 3 mm with additional indicators, such as peg shaped tonsils or kinking. Each patient was interviewed by the same neurologist to establish a detailed history of headaches. In addition, information was collected on patient demographics, the frequency, duration, and intensity of headaches, family history of headaches, activities that made the headaches worse, and use of mediations to treat the headaches. Only adults were included in the study.

Of the 73 people with Chiari, 11 (15%) were found to suffer from migraines (Figure 1), which is not significantly different from the general population. However of those with migraines, 8 of the 11 suffered from chronic migraines (more than 15 days a month), which is three times the rate in the general population. Finally, two were found to suffer migraines with auras, which are visual disturbances such as flashing lights.

Next, the researchers chose to compare the Chiari-migraine sufferers to people with migraines but no Chiari. To do this, they created a control group of migraine patients with normal MRIs, who were selected to match the general age and gender make up of the Chiari group.

In comparing the two groups, the scientists found a number of notable differences (Figure 2). Specifically, the Chiari group tended to begin having migraines at a much younger age (13 years) than the general migraine group (25 years). In addition, the Chiari group on average suffered from migraines 6 days more a month than the control group. The intensity of headaches was also higher in the Chiari group, averaging 7 on a scale of 0-10 versus 5 for the migraine only group. Finally, the number of people who suffered from nausea and vomiting was higher in the Chiari group. Although, there were only 10 patients in the Chiari group and 8 in the control group, all these differences were found to be statistically significant, meaning the difference is not likely to be due to chance.

However, given the small size of the study, the results should be considered preliminary and used as a guide for further research, rather than a basis for strong conclusions. For example, beyond simply repeating this study with more patients, it would be interesting to compare Chiari patients who have migraines to Chiari patients who don't. Are there anatomical differences, such as the size of their posterior fossas? Or perhaps a difference woul be found in the cerebrospinal fluid which would provide a clue as to the nature of the connection between Chiari and migraines.

While Chiari is fundamentally a structural problem, no known structural abnormalities - such as could be seen on an MRI - have been found in association with migraines. Based on this research it is difficult to speculate on why chronic migraines would be more frequent among Chiari patients, but the authors do point out that one migraine theory involves pain centers found in the brainstem. The herniated tonsils with Chiari can easily put pressure on the brainstem and other brainstem issues, such as central sleep apnea, have been found to be more frequent among Chiari patients.

Although not fully understood, it seems clear that there is some type of connection between migraines and Chiari. An interesting question to answer with future research is whether decompression surgery reduces the frequency and/or intensity of migraines among Chiari patients.

Figure 1: Frequency of Migraines Among Chiari Patients (73 Total)

cerebellar tonsils - portion of the cerebellum located at the bottom, so named because of their shape

cerebellum - part of the brain located at the bottom of the skull, near the opening to the spinal area; important for muscle control, movement, and balance

cerebrospinal fluid (CSF) - clear liquid in the brain and spinal cord, acts as a shock absorber

Chiari malformation I - condition where the cerebellar tonsils are displaced out of the skull area into the spinal area, causing compression of brain tissue and disruption of CSF flow

decompression surgery - general term used for any of several surgical techniques employed to create more space around a Chiari malformation and to relieve compression

syringomyelia - condition where a fluid filled cyst forms in the spinal cord

Source

Kaplan Y, Oksuz E, Chronic migraine associated with the Chiari type 1 malformation, Clin Neurol, Neurosurg (2008), doi:10.1016/j.clineuro.2008.05.016

	Number	Percent
Migraine	11	15%
Chronic Migraine	8	11%
Migraine w/aura	2	3%

Figure 2: Significant Differences Between Chiari Migraine Patients and General Migraine Patients

	Chiari Migraine	General Migraine
Age at onset	12.75	24.7
# days per month	23	17
Pain intensity	7	5.2
Number w/nausea	8	4
Number w/vomiting	8	2
Aggravated by physical activity	8	3

Note: All listed differences were found to be statistically significant, meaning the difference is not likely to be due to chance; there were 10 patients in the Chiari group and 8 in the control group

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