

## Key Points

1. Fibromyalgia is a condition involving generalized muscle pain, fatigue, and trouble sleeping
2. Some publications have noted a high rate of Chiari among FM patients
3. Prospective, controlled, blinded study looked at the rate of CM in FM patients compared to controls
4. FM patients reported more pain, fatigue and sleep problems than controls
5. FM patients also reported headaches similar to Chiari
6. MRIs showed no different in tonsillar position, posterior fossa size, or CSF flow
7. Rate of Chiari, defined as greater than 5mm, was not significantly different between groups

## Definitions

**blinded** - research technique where the investigators are not aware of whether participants are in the study group or control group

**cervical** - upper part of the spine

**cine MRI** - type of imaging test which can measure CSF flow and velocity

**control** - research technique where a group of health (or normal) subjects is used as a basis of comparison

**fibromyalgia (FM)** - condition characterized by pain, fatigue, and sleep disturbances

**foramen magnum** - opening at the base of the skull through which the brain and spine connect

**posterior fossa** - area in the lower, back part of the skull where the cerebellum is situated

**prospective** - type of research study which looks forward in time

**Visual Analog Scale** - simple

## NIH Funded Study...Chiari Not Associated With Fibromyalgia

June 30th, 2011 -- Fibromyalgia (FM) is a condition characterized by muscle pain, fatigue, and trouble sleeping. Fibromyalgia may affect as many as 6 million people in the US, with the vast majority being women. The underlying cause of Fibromyalgia is not well understood and patients are diagnosed through a series of criteria established by the American College of Rheumatology. Fibromyalgia patients often report that their symptoms started after some type of trauma such as a car accident or other neck injury.

Interestingly, there is a good deal of overlap in symptoms between FM and Chiari, especially in the types of headaches and triggering factors. Because of this, there have been some published studies which have showed a high rate of Chiari among FM patients and some surgeons have even proposed decompression surgery to relieve FM type symptoms. Unfortunately, these studies had significant flaws and until now the potential connection between FM and Chiari has not been rigorously investigated, and in fact has been quite controversial.

Recently however, a research group from the University of Washington published the results of an NIH funded, prospective, controlled, blinded study which found that the prevalence of Chiari among a group of FM patients was no different than among a group of healthy control subjects.

For the research study, 176 FM patients were recruited through both a local clinic and advertising. To qualify for the study, they had to be at least 18, not pregnant, diagnosed with FM, and able to get an MRI. Upon enrollment in the research study, the FM diagnosis was confirmed and the patients reported on their pain, fatigue, and sleep over the previous month using a simple 0-10 scale, with 0 being the best and 10 being the worst. In addition, they answered a questionnaire about headache history, including location, severity, and triggering factors. Finally, each patient underwent MR imaging to evaluate the position of the cerebellar tonsils, the volume of their posterior fossa, and their CSF flow.

A control group of 67 healthy subjects - no reports of pain or fatigue - was also recruited and given the same surveys and imaging tests. Ideally, a control group should be age and gender matched to the study group, but in this case, the FM group was significantly older and predominantly more female (93% vs 54%). For the purposes of the study, the presence of Chiari was defined as either: tonsillar herniation of 5mm or greater; or tonsillar herniation between 3mm-5mm plus any one of pointed tonsils, small posterior fossa, or abnormal CSF flow.

In terms of pain, sleep, and fatigue, the FM group reported significantly more problems than the control group (Table 1). And in looking at the headache questionnaire, the FM responses - again different than the controls - would be quickly recognized by any Chiari patient, with posterior headaches brought on by exercise, straining, coughing, etc. (Table 2).

**Table 1: Sleep, Fatigue, and Pain Ratings For FM Patients (176) and Controls (67)**

	FM Group	Control Group
Sleep	6.2	4.1
Fatigue	6.8	3.4
Pain	6.8	2.5

**Notes:** All scales were 0-10 with 0=Best and 10=Worst; Differences between groups were statistically significant for all 3 measures

**Table 2: Common Headache Precipitating Factors Among FM Patients (176)**

Factor	%
Exercise	74
Straining	70
Sports	62
Coughing	59

technique where a measure such as pain or fatigue is rated by the patient using a number line

**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

*Is Chiari I malformation associated with fibromyalgia?*  
Watson NF, Buchwald D, Goldberg J, Maravilla KR, Noonan C, Guan Q, Ellenbogen RG. Neurosurgery. 2011 Feb;68(2):443-8;

**Notes:** Additional factors were cited; all factors above were significantly different, percentage wise, from the control group

However, the researchers found no significant differences between the two groups on the MRI results. The average tonsillar position, size of the posterior fossa, and CSF flow were all very similar. In addition, the rate of Chiari, as defined by the researchers, was also not statistically different. Specifically, there were 5 patients in the FM group with tonsillar herniation greater than 5 mm and 3 people in the control group, which means the rate in the control group was actually higher. There were no people in either group between 3mm - 5mm. It should also be noted that the shape of the cerebellar tonsils was normal in every case greater than 5 mm.

Scientifically, this is a well designed prospective study with a control group and the investigators blinded to whether the participants were in the control group or study group. From that point of view, it would be reasonable to draw the conclusion that the prevalence of Chiari, as defined by tonsillar herniation of greater than 5mm, is no higher among FM patients than you would expect.

However, given that it is not really understood why some people with tonsillar herniations are symptomatic - or become symptomatic at a later age or after a trauma - and the fact that some of the FM symptoms are so similar to Chiari, one has to wonder if the book is completely closed on this subject, or if it should be revisited when Chiari symptoms are more fully understood. This is not to suggest that there is a link between Chiari and FM, and the fact that the researchers also did not find any peg-like tonsils, or small posterior fossas, or abnormal CSF is more evidence against a connection. Rather it is just interesting to think about the implications of the symptom overlap between the conditions, and what role, if any, trauma plays in each.

Finally, the authors suggest that further studies involve dynamic MRI where the neck is positioned at different angles.

-- Rick Labuda

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