Key Points

1. Drop attacks refer to a sudden loss of consciousness, or passing out.
2. A small percentage of Chiari patients suffer from drop attacks.
3. However, there is some controversy over whether Chiari can actually cause drop attacks.
4. Researchers reviewed records of over 250 Chiari patients and found 10 with drop attacks who had had tilt table testing.
5. Surgery improved the drop attacks 70% of the time, but the tilt table testing was not useful diagnostically.

Definitions

- autonomic nervous system: part of the nervous system that controls vital, unconscious actions, such as breathing and heart rate.
- drop attack: term commonly used to refer to episodes of passing out in Chiari patients.
- dysautonomia: any problem with the autonomic nervous system.
- EKG: electrocardiogram; test which measures the electrical activity of the heart in graphical form.
- orthostatic intolerance: condition where people get light-headed from standing up too quickly due to low blood pressure.
- syncope: fainting, passing out.
- tilt table: a motorized table which can change a person’s position from prone to standing to test for lightheadedness, dizziness, and syncope.
- 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 cord.

Chiari Drop Attacks

January 31st, 2010 – A small but noticeable percentage of Chiari patients suffer from what have come to be known as drop attacks. The medical term for a drop attack is syncope, but basically it means that the person passes out or temporarily loses consciousness. As with many patients of Chiari, historically there has been controversy regarding drop attacks. Specifically, some physicians and researchers do not believe there is a connection between Chiari and drop attacks.

A recent study out of the University of Chicago, and published in Pediatric Neurosurgery, brought both good and bad news to bear on the subject. The good news is that the research presents fairly strong evidence that Chiari can cause syncope and that decompression surgery can alleviate the problem in a majority of cases. The bad news is that there is no good test available which can say beforehand whether decompression surgery will help with drop attacks.

The autonomic nervous system is what controls many critical bodily functions, such as breathing and heart rate. A problem with the autonomic nervous system is referred to as dysautonomia, and one manifestation of dysautonomia is syncope, or passing out. Since Chiari can put pressure on the hindbrain and brainstem, it does not seem to be a stretch that it could cause problems such as syncope, but the reality is that the specifics of how Chiari may be linked to drop attacks is not at all clear.

More commonly, syncope is related to heart problems, and heart testing, such as an EKG, is common. However, when nothing can be found wrong with the heart, some patients undergo what is called tilt table testing. In a tilt table test, a person is strapped to a motorized table which can change their position from prone to upright. Blood pressure and other vital signs are monitored during these position changes to look for indications of a problem. Although tilt table testing is not uncommon, its usefulness is limited by a lack of testing standards and variations in the interpretation of results.

The researchers believe that the surgical results, with 70% improving in terms of drop attacks, is a pretty strong indication that Chiari can indeed cause drop attacks, even if the exact underlying mechanism is not currently known. However, when the scientists looked at the specifics of the tilt table test results versus surgical outcome (Table 1), they didn’t really find anything. In fact, the tilt table accurately predicted surgical improvement only 40% of the time (meaning a positive tilt table result would lead to a positive surgical outcome). This is obviously way too low to be at all useful.

Therefore, while Chiari patients with drop attacks may get relief from decompression surgery, pre-surgical testing with a tilt table is not a useful approach.

Table 1: Tilt Table Testing Results vs Surgical Outcome (10 Patients)

<table>
<thead>
<tr>
<th>Tilt Table Results</th>
<th>Surgical Outcome</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Improved</td>
<td>No Change</td>
</tr>
<tr>
<td>Positive</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Negative</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>
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

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