CONQUER CHIARI®
RESEARCH CENTER

CONQUER CHIARI®
From Knowledge, Strength. Through Research, Hope.

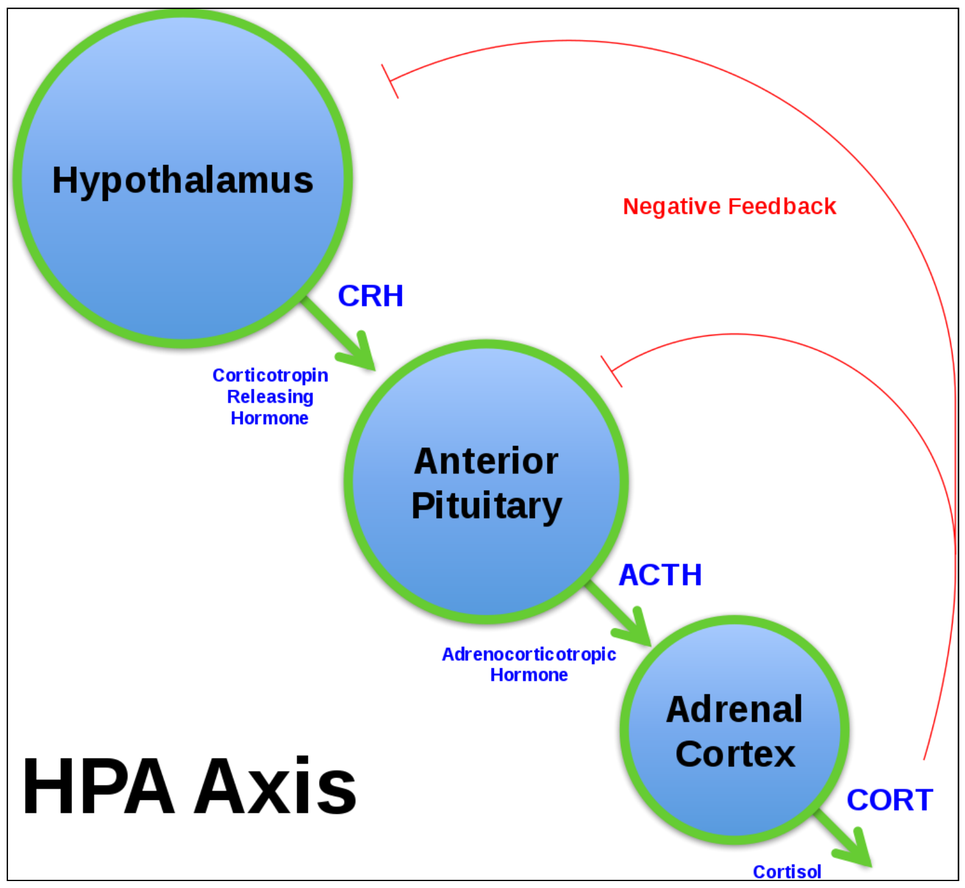
The Role of the Pituitary in Chiari Related Depression and Anxiety

Richard Labuda, Dorothy Loth, Francis Loth, Philip A Allen

Purpose

Previous CCRC studies have found extremely high rates of depression and anxiety among adult CMI patients. The CCRC is working on a theory that this is linked to the HPA Axis (see picture). The HPA axis is cascading series of hormones that involve the hypothalamus, the pituitary, and the adrenal cortex. The HPA Axis is important in regulating stress and dysfunction of the HPA Axis can lead to anxiety and depression. Ideally, studying HPA function would involve analyzing hormone levels in patients over a period of time, but this type of project is expensive and difficult to conduct. As a preliminary step, we can look at the size of the pituitary gland from MRIs collected as part of the Chiari1000 to see if it is different in highly depressed CMI patients. The pituitary is about the size of pea, is in the middle of the brain, and is sometimes referred to as the 'master' gland because it is controls many other glands and their hormone production. It is comprised of two distinct parts, the anterior and posterior, each of which have different functions.

Hypothalamus-Pituitary-Adrenal (HPA) Axis (Source: Wikipedia)

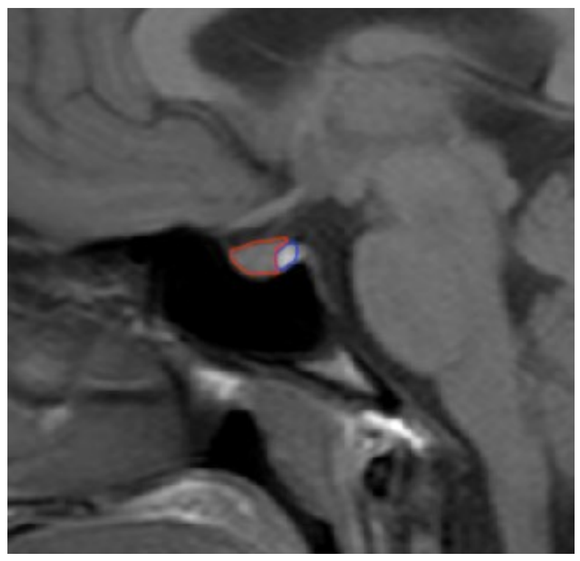


Methods

The mid-sagittal MRIs of approximately 30 high depression CMI patients (as scored on CES-D scale), 30 low depression CMI patients, and 30 healthy controls will be measured to determine and compare:

- Total pituitary area
- Anterior pituitary area
- Posterior pituitary area
- Anterior/Posterior area ratio

Mid-sagittal MRI of CMI Patient Showing Anterior (Red) and Posterior (Blue) Pituitary Gland Outlined for Area Measurement



Results

This study is ongoing, but if the size of either the anterior or posterior pituitary is smaller among depressed patients it would support the hypothesis that the HPA Axis is involved.

Definitions:

Mid-sagittal: The sagittal plane divides the body into left and right, with the mid-sagittal being in the middle
Hormone: Chemical substances that act like messenger molecules in the body. They are made in one part of the body, then travel to other parts to control how cells and organs function.
Hypothalamus: A region of the brain that controls hunger, thirst, body temperature, and releases hormones to the pituitary
Adrenal Cortex: The outer part of the adrenal glands responsible for, among other things, making corticosteroid hormones.