



Glycocalyx Rejuvenation Centers Inc.

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Dementia Types Understood

Cortical Dementia / Progressive Dementia

Brains Grey Matter – Alzheimer’s

- Problems – Memory, speech, finding the right words, communications.

Subcortical / Primary Dementia

Brains White Matter

- Huntington’s disease
- Parkinson’s
- AID’S Dementia

Secondary Dementia – Vascular Dementia

- Stroke. Heart attack
- Brain injuries including whiplash, and all concussions.

Amygdala

- Where all memories are stored
- Fear conditioning

Blood Brain Barrier (Break or Leakage)

Researchers using contrast-enhanced MRI have identified leakages in the blood-brain barrier (BBB) of people with early Alzheimer's disease (AD), according to a new study published online in the journal *Radiology*. The results suggest that increased BBB permeability may represent a key mechanism in the early stages of the disease.

The BBB, a collection of cells and subcellular structures in the cerebrovascular wall that separates the circulating blood from the brain, is essential to keep brain tissue in healthy condition. It regulates the delivery of important nutrients and blocks neurotoxins, while removing surplus substances from the brain. For the study, researchers used contrast-enhanced MRI to compare 16 early AD patients with 17 healthy age-matched controls. They measured BBB leakage rates and generated a map called a histogram to help determine the amount of the leaking brain tissue.

The BBB leakage rate was significantly higher in AD patients compared with controls and the leakage was distributed throughout the cerebrum--the largest part of the brain. AD patients had a significantly higher percentage of leaking brain tissue in the gray matter, including the cortex, the brain's outer layer. The researchers also found that measurements derived from the histogram showed very subtle BBB impairment in the brain's white matter.

"Blood-brain barrier leakage means that the brain has lost its protective means, the stability of brain cells is disrupted and the environment in which nerve cells interact becomes ill-conditioned," said study author Walter H. Backes, Ph.D., from the Maastricht University Medical Center in Maastricht, the Netherlands. "These mechanisms could eventually lead to dysfunction in the brain."

Indeed, the researchers found a relationship between the extent of BBB impairment and decline in cognitive performance, suggesting that a compromised BBB is part of the early pathology of AD and might be part of a cascade of events eventually leading to cognitive decline and dementia.

The connection between BBB impairment and AD pathology was strengthened by the fact that the addition of diabetes and other non-cerebral vascular diseases to the analysis model did not change the results. According to Dr. Backes, the key advantage of detecting BBB leakage with contrast MRI is that I can detect early microvascular changes in AD even in cases where no directly visible cerebrovascular abnormalities can be observed.

"For Alzheimer's research, this means that a novel tool has become available to study the contribution of blood-brain barrier impairment in the brain to disease onset and progression in early stages or pre-stages of dementia," he said.

Conditions (areas) affecting the Blood brain barrier break Brain stem, Cranial nerves, Cerebral spinal fluid, Meningitis.



Hippocampus

Three reasons to care about the hippocampus: memory, depression, estrogen.

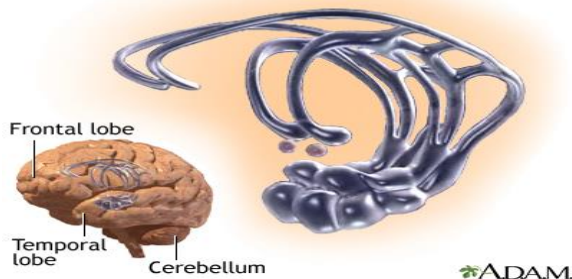
Part of the brain appears to be absolutely necessary for making new memories. If you didn't have it, you couldn't live in the present: you'd be stuck in the past of old memories. And this is common: Alzheimer's disease affects the hippocampus first and severely, before other parts of the cortex (later, the frontal lobes too). So memory is usually the first thing to start to falter in Alzheimer's — the ability to make new ones, that is. Who visited yesterday? Where did I put the car keys? Why isn't there any mail today (when you brought it in 3 hours ago)?

The hippocampus schizophrenia and some severe depressions, the hippocampus *appears to shrink*. However there is recent evidence that this shrinkage can be reversed and perhaps prevented in people with depression and bipolar disorder, with effective treatment.

The hippocampus is known to be directly affected by estrogen.

Limbic system

Hippocampus and fornix (limbic system)



Overview

The limbic system of the brain is a group of structures which govern emotions and behavior. The limbic system, and in particular the hippocampus and amygdala, is involved in the formation of long-term memory, and is closely associated with the olfactory structures (having to do with the sense of smell).

Viruses

Viral encephalitis is an inflammation of the brain caused by a virus. Some viral diseases, such as measles and rubella, can also progress to involve inflammation of the brain. Other micro-organisms, such as bacteria, fungi and parasites, are capable of triggering encephalitis, but viruses – particularly the group known as enteroviruses – are the leading cause. Once inside the blood, the viruses migrate to the brain where they start to multiply.

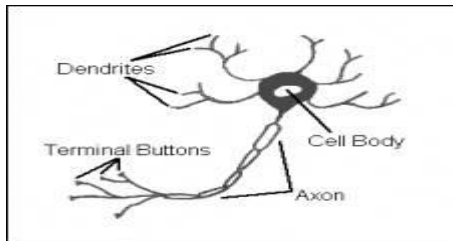
The body notices the invasion and mounts an immune system response. This causes the brain to swell. The combination of infection and immune response creates the typical symptoms of viral encephalitis. The major risk from viral encephalitis is permanent brain damage. Children aged one year or less and adults aged 55 years and over are more vulnerable to life threatening complications.

Brain neurotransmitters receptor site system



- A Neuron is a specialized nerve cell that receives, processes, and transmits information to other cells in the body. We have a fixed number of neurons, which means they do not regenerate. About 10,000 neurons die everyday, but since we start out with between ten and 100 billion (Hooper & Teresi, 1987), we only lose about 2% over our lifetime.
- Information comes into the neuron through the Dendrites from other neurons. It then continues to the Cell Body – (soma) which is the main part of the neuron, which

contains the nucleus and maintains the life sustaining functions of the neuron. The soma processes information and then passes it along the Axon. At the end of the axon are bulb-like structures called Terminal Buttons that pass the information on to glands, muscles, or other neurons.



Anatomy of a Neuron

- Information is carried by biochemical substances called neurotransmitters, which we will talk about in more detail shortly. The terminal buttons and the dendrites of other neurons do not touch, but instead pass the information containing neurotransmitters through a Synapse. Once the neurotransmitter leaves the axon, and passes through the synapse, it is caught on the dendrite by what are termed Receptor Sites.
- Neurotransmitters have been studied quite a bit in relation to psychology and human behavior. What we have found is that several neurotransmitters play a role in the way we behave, learn, the way we feel, and sleep. And some play a role in mental illnesses. The following are those neurotransmitters which play a significant role in our mental health.

Hypothalamus

Low Dopamine, Low Serotonin, Memory Loss, and sleep disorders

Balancing/Rebuilding Immune System

- Blood
- Bone marrow
- Liver
- Lymph fluids
- Lymph nodes