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Are These Strange Visual Symptoms a Sure Sign of Alzheimer's?

Analysis by Dr. Joseph Mercola | February 13, 2024

STORY AT-A-GLANCE

- A rare disorder known as posterior cortical atrophy (PCA) may be among the earliest signs of Alzheimer's disease
- The progressive impairment in visuoperceptual and visuospatial processing leads to a strange array of symptoms, such as difficulty following lines of text when reading, problems writing and trouble picking up objects
- While only an estimated 5% to 10% of people with Alzheimer's develop PCA, symptoms typically develop earlier than those of typical Alzheimer's disease
- PCA is almost always caused by Alzheimer's; among those with PCA, 94% developed Alzheimer's disease
- Other PCA symptoms include an inability to copy basic figures, trouble visually perceiving more than one object at a time and new difficulty performing basic math calculations and reading

A rare disorder known as posterior cortical atrophy (PCA) may be among the earliest signs of Alzheimer's disease. Surprisingly, it involves no signs of memory issues but rather presents with visual symptoms. Also known as Benson's syndrome, PCA is sometimes described as a visual variant of Alzheimer's disease, which affects brain regions involved in spatial perception, complex visual processing and more.[1]

The progressive impairment in visuoperceptual and visuospatial processing leads to a strange array of symptoms, such as difficulty following lines of text when reading, problems writing and trouble picking up objects. While only an estimated 5%[2] to 10%[3] of people with Alzheimer's develop PCA, symptoms typically develop earlier than those of typical Alzheimer's disease and are "overwhelmingly" predictive of Alzheimer's.[4]

These Visual Symptoms Are an Early, Sure Sign of Alzheimer's

A study led by University of California San Francisco (UCSF) researchers, published in The Lancet Neurology,[5] assessed data from 1,092 patients spread across 16 countries. Among those with PCA, 94% developed Alzheimer's disease, "indicating that the posterior cortical atrophy clinical syndrome is usually caused by underlying Alzheimer's disease neuropathology," the researchers explained.[6]

Among the other 6%, conditions like Lewy body disease and frontotemporal lobar degeneration were often present.[7] The study also found that PCA often has a relatively young age of onset, on average 59.4 years. Further, 75% of the study participants developed PCA before age 65, which is the threshold used for early-onset dementia.

"Unlike memory issues, patients with PCA struggle with judging distances, distinguishing between moving and stationary objects and completing tasks like writing and retrieving a dropped item despite a normal eye exam," study author Marianne Chapleau, of the UCSF Department of Neurology, the Memory and Aging Center and the Weill Institute for Neurosciences said in a news release.[8] At the time of PCA diagnosis:[9]

- 61% had constructional dyspraxia, an inability to copy basic figures
- 49% had a space perception deficit, meaning it was difficult to identify the location of an object they saw
- 48% had simultanagnosia, an inability to visually perceive more than one object at a time
- 47% had new trouble performing basic math calculations
- 43% had new difficulties reading

Further, among those affected, 60% were women, suggesting females may be more susceptible. Overall, the team noted:[10]

> *"We have shown that Alzheimer's disease pathological findings are highly prevalent, and that posterior cortical atrophy could be the most predictive syndrome for Alzheimer's disease neuropathological features … People with posterior cortical atrophy often face a delay in diagnosis because of their young age and visual-predominant symptoms.*
>
> *Better awareness of the syndrome of posterior cortical atrophy among neurologists, primary care providers, optometrists, and ophthalmologists is needed for early detection and treatment."*

Clinicians May Not Connect Visual Symptoms With Alzheimer's

Raising awareness about PCA symptoms and their connection to Alzheimer's is important, as they serve as an early indicator of Alzheimer's. Most PCA patients have normal cognition in the early stages, but by the time a diagnosis is made — an average of 3.8 years after symptoms begin — mild or moderate dementia has often set in, including problems with memory, executive function, behavior, speech and language.[11]

Understandably, many people first visit an optometrist or ophthalmologist when experiencing visual symptoms — clinicians who aren't likely to make an Alzheimer's connection. "In people with PCA, the visual problems are not due to problems with their eyes. Rather, the shrinking brain can no longer interpret and process the information received from the person's healthy eyes," according to UCSF's Memory and Aging Center and the Weill Institute for Neurosciences.[12] Chapleau said:[13]

> *"We need more awareness of PCA so that it can be flagged by clinicians. Most patients see their optometrist when they start experiencing visual symptoms and may be referred to an ophthalmologist who may also fail to recognize PCA. We need better tools in clinical settings to identify these patients early on and get them treatment."*

Symptoms can be subtle and easy to miss. In one example, a UCSF patient experienced visual symptoms for years before being diagnosed with Alzheimer's. His wife first recognized something was wrong when he had trouble addressing envelopes — and neither an optician nor an ophthalmologist was able to make a diagnosis.[14] In addition to the symptoms listed above, PCA may also lead to:[15]

Blurred vision	Problems with depth perception	Increased sensitivity to bright light or shiny surfaces
Double vision	Difficulty seeing in low light	Getting lost in familiar places
Inability to recognize familiar faces and objects	Inability to make coordinated movements	Visual hallucinations

Is Excess Iron in the Brain Involved?

Research suggests iron (Fe) deposition in the brain is a feature of PCA,[16] and it's also linked to Alzheimer's. An imbalance of iron in the body can lead to ferroptosis, a programmed cell death pathway known to play a role in neurodegenerative diseases like Alzheimer's.[17] Previous research also suggests Alzheimer's patients typically have elevated iron levels in the brain, but at the time there was no way to measure two different forms of iron (Fe2+ and Fe3+).

Research published in Science Advances[18] changed that, as the team developed DNA-based fluorescent sensors capable of detecting Fe2+ and Fe3+ in animal studies. The sensors glow different colors for each type of iron, allowing researchers to see their quantity and how they're distributed in the brain.[19] Study author Yuting Wu with UT Austin explains:[20]

> *"The best part about our sensor is that we can now visualize the changes of Fe2+ and Fe3+ and their ratios in each location. We can change one parameter*

at a time to see if it changes the plaques or the oxidative states of iron."

The tests revealed "a decreased Fe3+/Fe2+ ratio during ferroptosis and an increased Fe3+/Fe2+ ratio in Alzheimer's disease." Further, the team notes, "The elevated Fe3+/Fe2+ ratio was mainly observed in amyloid plaque regions, suggesting a correlation between amyloid plaques and the accumulation of Fe3+ and/or conversion of Fe2+ to Fe3+."[21]

In areas of the brain where amyloid beta plaques tend to accumulate, an increase in iron redox was revealed, suggesting that iron located in these areas became "more reactive in the presence of oxygen."[22] The team concluded:[23]

"Our data suggest that not only total iron but also iron redox cycling is involved in the progression of AD [Alzheimer's disease]. Combining these data with our observation that both Fe2+ and Fe3+ levels increased around Aβ plaque regions and suggests a potential role of Aβ plaques in accumulating Fe3+ over Fe2+ from surrounding cells and/or proteins in AD mouse brains …

However, it is unknown whether the dysregulated iron is involved in amyloid plaque formation, or this is a secondary effect of amyloid plaque formation …"

Too Much Iron 'Rusts' Your Brain

While iron plays an important role in brain activities such as neurotransmitter synthesis, myelination and mitochondrial function, it can also be a source of oxidative stress. Iron accumulation in the brain, which may occur with aging, may be a contributing factor to neurodegeneration. It's unknown why iron accumulates in the brain with age, but it may be linked to inflammation.[24]

Ferritin is a protein that's the carrier molecule of iron. Plasma ferritin also tends to be elevated in patients with Alzheimer's disease, while the APOE4 gene, which is considered to be the strongest risk factor for Alzheimer's disease,[25] is also known to elevate iron levels in the brain.[26]

In fact, elevated levels of iron in your brain may actually be the mechanism that makes APOE4 a major genetic risk factor for the disease.[27] Writing in the Journal of Biological Chemistry, researchers explained that iron could contribute to Alzheimer's in multiple ways, including:[28]

- Driving the formation of plaques and tangles
- Promoting amyloid beta aggregation
- Triggering neuronal toxicity

"Taken together," the team explains, "these findings build a case for how iron, either building up in the tissue, bound to the amyloid or tangle proteinopathy, inducing the proteinopathy, or in tandem with the proteinopathy, might contribute to AD pathophysiology. Targeting iron, therefore, might be a therapeutic strategy for AD."[29]

Where does excess iron come from? Aside from genetics, which can contribute to hereditary hemochromatosis, or iron overload, virtually all adult men and postmenopausal women are also at risk for iron overload since they do not lose blood on a regular basis. Blood loss is the primary way to lower excess iron.

Eating processed foods fortified with iron, taking iron-containing supplements or cooking in iron pots and pans can also increase your risk of iron overload. Drinking well water that's high in iron is also a risk, as is alcohol consumption, as it increases the absorption of dietary iron.

The good news is lowering your iron is easy. All you need to do is donate blood two to four times a year. To find out your level, have your iron levels checked using a simple blood test called a serum ferritin test. I believe this is one of the most important tests that everyone should have done on a regular basis as part of a preventive, proactive health screen. If your ferritin levels are low, it means your iron levels are also low.

The healthy range of serum ferritin lies between 20 and 80 nanograms per milliliter (ng/ml). Below 20 ng/ml is a strong indicator that you are iron deficient, and above 80 ng/ml suggests you have an iron surplus. An ideal range is between 40 and 60 ng/ml.

Help for Alzheimer's Treatment

Alzheimer's disease requires a **comprehensive prevention** and treatment strategy. One of the most comprehensive assessments of Alzheimer's risk is Dr. Dale Bredesen's ReCODE protocol, which evaluates 150 factors, including biochemistry, genetics and historical imaging, known to contribute to Alzheimer's disease.

In his book, "The End of Alzheimer's: The First Program to Prevent and Reverse Cognitive Decline,"[30] which describes the complete protocol, you will also find a list of suggested screening tests and the recommended ranges for each test, along with some of Bredesen's treatment suggestions.

By leveraging 36 healthy lifestyle parameters, Bredesen was able to reverse Alzheimer's in 9 out of 10 patients. For more details, you can download Bredesen's full-text case paper online, which describes the full program.[31] If you or a loved one has been diagnosed with PCA, implementing the program immediately may be helpful.

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