

Dementia with Lewy bodies (DLB)

A topic in the Alzheimer's Association® series on understanding dementia.

About dementia

Dementia is a general term for a decline in mental ability severe enough to interfere with daily life. Dementia is not a single disease; it's the umbrella term for an individual's changes in memory, thinking or reasoning. There are many possible causes of dementia, including Alzheimer's disease. Disorders grouped under the general term "dementia" are caused by abnormal brain changes. These changes trigger a decline in thinking skills, also known as cognitive abilities, severe enough to impair daily life and independent function. They also affect behavior, feelings and relationships.

Brain changes that cause dementia may be temporary, but they are most often permanent and worsen, leading to increasing disability and a shortened life span. Survival can vary widely, depending on such factors as the cause of the dementia, age at diagnosis and coexisting health conditions.

Dementia with Lewy bodies (DLB)

Dementia with Lewy bodies is a type of dementia that leads to a progressive decline in thinking, reasoning and independent function because of abnormal microscopic deposits that gradually destroy certain brain cells. These deposits — named after Frederick H. Lewy, M.D., the neurologist who discovered them while working in Dr. Alois Alzheimer's laboratory during the early 1900s — consist primarily of alpha-synuclein, a protein found widely in the brain but whose normal function is not fully known. A study published on July 29, 2019 in *Scientific Reports* suggests that Lewy bodies are problematic because they pull alpha-synuclein protein out of the nucleus of brain cells. The study examined cells of living mice and postmortem brain tissue in humans, and revealed that these proteins perform a crucial function by repairing breaks that occur along the vast strands of DNA present in the nucleus of every cell in the body.

Alpha-synuclein's role in DNA repair may be crucial in preventing cell death. This function may be lost in brain diseases such as DLB and Parkinson's, leading to the widespread death of neurons.

Lewy bodies are also found in several other brain disorders, including Alzheimer's disease and Parkinson's disease dementia. Many people with Parkinson's develop problems with thinking and reasoning, and many people with DLB experience

movement symptoms, such as a hunched posture, rigid muscles, a shuffling walk and trouble initiating movement.

This overlap in symptoms and other evidence suggest that DLB, Parkinson's disease and Parkinson's disease dementia may be linked to the same underlying abnormalities in how the brain processes alpha-synuclein. Many people with both DLB and Parkinson's disease also have plaques and tangles — hallmark brain changes linked to Alzheimer's disease.

A growing body of evidence suggests genetics may play a role in DLB and that some cases may be inherited. Scientists have found that some of these rare cases can be caused by mutations in the gene SNCA, which codes for alpha-synuclein, the main protein found in Lewy bodies. Further research has found that variants in the gene for apolipoprotein E (APOE), which is known to play a role in Alzheimer's disease, may also play one in Lewy body dementia. A recent study published in the February 15, 2021 issue of *Nature Genetics* found that genes called BIN1 and TMEM175 are implicated in DLB as well. These genes may also have ties to Alzheimer's and Parkinson's diseases.

Prevalence

Most experts estimate that DLB is the third-most-common cause of dementia after Alzheimer's disease and vascular dementia. About 5% of individuals with dementia show evidence of DLB alone, but most people with DLB also have evidence of Alzheimer's disease in the brain.

Symptoms

Hallmark DLB symptoms include changes in thinking and reasoning; confusion and alertness that varies significantly from one time of day to another or from one day to the next; Parkinson's symptoms, such as a tremors, hunched posture, balance problems and rigid muscles; visual hallucinations; delusions; trouble interpreting visual information; a problem with acting out vivid dreams, known as rapid eye movement (REM) sleep disorder; malfunctions of the autonomic nervous system; behavior problems; and memory loss that may be less prominent than in Alzheimer's.

Diagnosis

There is no single test — or any combination of tests — that can conclusively diagnose DLB in a living individual. A thorough dementia diagnostic evaluation includes physical and neurological examinations, interviews with the person and family or other caregiver (including a detailed lifestyle and medical history), and neuropsychological and mental status tests. The person's functional ability, attention, language, visuospatial skills, memory and executive functioning are assessed. In

addition, brain imaging (CT or MRI scans), blood tests and other laboratory studies may be performed. Today, DLB is a clinical diagnosis, representing a doctor's best professional judgment about the reason for a person's symptoms. The only way to confirm DLB is through autopsy.

Many experts now believe that DLB and Parkinson's disease dementia are two different expressions of the same underlying problems with the brain's processing of alpha-synuclein. But most experts recommend continuing to diagnose DLB and Parkinson's dementia as separate disorders.

Guidelines for diagnosing DLB and Parkinson's disease dementia are:

- **DLB:** Dementia symptoms consistent with DLB develop first; both dementia symptoms and movement symptoms are present at the time of diagnosis; or dementia symptoms appear within one year after movement symptoms.
- **Parkinson's disease dementia:** A person is originally diagnosed with Parkinson's disease based on movement symptoms, and dementia symptoms don't appear until a year later or more.

Since Lewy bodies tend to coexist with Alzheimer's brain changes, it may sometimes be difficult to distinguish DLB from Alzheimer's disease, especially in the early stages.

Causes and risk factors

As noted earlier, there is some evidence that suggests genetics are involved in DLB risk, but more research is needed to confirm the extent of the involvement. Researchers have not yet identified any specific causes of DLB. Most people diagnosed with DLB have no family history of the disorder. Age is currently the only confirmed risk factor for DLB — typical age of onset is after 50.

Outcomes

Like other types of dementia that destroy brain cells, DLB symptoms get worse over time and shorten life span. A person can live with DLB between two and 20 years, on average, depending on the person's overall health and existence of other illness(es).

Treatment

There are no treatments to slow or stop the brain cell damage caused by DLB. Current treatment strategies focus on improving symptoms. If a treatment plan includes medications, it's important to work closely with a physician to identify the drugs and the most effective doses.

- **Cholinesterase inhibitors** — drugs that are the current mainstay for treating cognitive changes in Alzheimer's — may also help DLB symptoms.
- **Carbidopa-levodopa** — may be prescribed to treat Parkinson's movement symptoms. However, it can sometimes aggravate hallucinations and confusion in those with Parkinson's dementia or DLB.
- **Selective serotonin reuptake inhibitors (SSRIs)** — used to treat depression, which is common in both DLB and Parkinson's disease dementia.
- **Clonazepam and melatonin** — may be used to treat REM disorder.

CAUTION: Antipsychotics drugs (such as haloperidol, fluphenazine or thioridazine) that are used to treat behavioral symptoms should be avoided. About 60% of people with DLB experience worsening of Parkinson symptoms, sedation, impaired swallowing or neuroleptic malignant syndrome (NMS). NMS is a life-threatening condition characterized by fever, generalized rigidity and muscle breakdown following exposure to traditional antipsychotics.

Additional resources

Lewy Body Dementia Association
LBDA.org

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