



LOS ANGELES CAREGIVER RESOURCE CENTER

Fact Sheet **Dementia with Lewy Bodies**

Dementia with Lewy Bodies (DLB) is a progressive degenerative disease or syndrome of the brain. It shares symptoms - and sometimes overlaps - with several diseases, especially with two common diseases of older adults, Alzheimer's and Parkinson's.

Persons who develop DLB have behavioral and memory symptoms of dementia like those of Alzheimer's disease and, to varying extents, the physical, motor system symptoms seen in Parkinson's. However, the mental symptoms of a person with DLB might fluctuate frequently, motor symptoms are milder than for Parkinson's disease, and DLB patients usually have vivid visual hallucinations.

Facts

“Dementia with Lewy Bodies” is the preferred term for several disorders or conditions that cause dementia. Dementia is a gradual, progressive decline in mental ability (cognition) that affects memory, thinking processes, behavior and physical activity. In addition to these mental symptoms, persons with DLB experience physical symptoms of parkinsonism, including mild tremor, muscle stiffness and movement problems. Strong visual hallucinations also occur.

DLB is named after smooth round protein lumps, called Lewy bodies, that are found in the nerve cells of affected brains. Lewy bodies are often present in the nuclei (nerve cells) of brains afflicted with a variety of disorders. In DLB, the Lewy bodies are found throughout the outer layer of the brain (the cerebral cortex) and deep inside the midbrain or brainstem. These “abnormal protein structures” were first described in 1912 by Frederick Heinrich Lewy, M. D., a contemporary of Alois Alzheimer who first identified the more common form of dementia that bears his name.

Because Lewy bodies are also often found in the brains of those diagnosed with Alzheimer's, Parkinson's, Down syndrome and other disorders, researchers agreed in 1995 to use the term “Dementia with Lewy Bodies” to describe both a single disease (sometimes called “pure DLB”) and a spectrum of disorders with similar or related pathology.

It is believed that DLB, as a defined disease process, accounts for as many as 20% of the seven million cases of dementia in the United States and for as much as one-third of dementing illness in elderly Americans. This makes DLB the second most common form of dementia after Alzheimer's.

Doctors and other clinical experts sometimes use other terms to describe DLB or variations of Lewy body syndromes, including "Diffuse Lewy Body Disease," "Cortical Lewy Body Disease," "Lewy Body Dementia," or "Lewy Body Variant of Alzheimer's Disease." Although debate about the nature of Lewy body-related disorders continues, most clinicians now follow the terminology and diagnosis recommendations for DLB developed in 1995 by an international consortium.

The cause of DLB is unknown and no specific risk factors are identified. Cases have appeared among families but there does not seem to be a strong tendency for inheriting the disease. Genetic research may reveal more information about causes and risk in the future.

Symptoms

Initial symptoms of DLB usually are similar to those of Alzheimer's or vascular dementia and are cognitive (mental) in nature. Other patients may first show the neuromuscular symptoms of Parkinson's disease. A small number of patients will begin with dementia and parkinsonism symptoms at the same time.

Key symptoms are:

- For most DLB patients, mild problems with recent memory, such as forgetting very recent events.
- Brief episodes of unexplained confusion and other behavioral or cognitive problems. The individual may become disoriented about the time or where he or she is; have trouble with speech, finding words or following a conversation, and experience visuospatial difficulty (such as finding one's way or working a jigsaw puzzle); and problems in thinking such as inattention, mental inflexibility, indecisiveness, lack of judgment and loss of insight.
- Fluctuation in the occurrence of these cognitive symptoms from moment to moment, hour to hour, day to day or week to week. For example, the person may converse normally one day and be mute, unable to speak the next day — or even from one moment to the next. While this is often felt to be an important part of DLB, it may occur in other dementias and is sometimes it is very difficult to determine whether fluctuation truly occurs in a given patient.
- Well-defined, vivid, visual hallucinations. In DLB's early stage, the person may even acknowledge and describe the hallucinations. Other types of hallucinations are less common but sometimes occur. These might be auditory ("hearing" sounds), olfactory ("tasting" something) or tactile ("feeling" something that isn't there).
- Movement (motor function) problems of parkinsonism, sometimes referred to as "extrapyramidal" signs. These symptoms often seem to start spontaneously and may include

Movement and motor problems occur in later stages for 70% of persons with DLB. But for 30% of DLB patients and more commonly those that are older, Parkinson's symptoms occur first, before dementia symptoms. In these individuals cognitive decline tends to start with depression or mild forgetfulness.

Testing and Diagnosis

Dementia with Lewy Bodies is difficult to diagnose. Not only does it resemble other dementias, it overlaps with Alzheimer's, Parkinson's and other disorders, which may be difficult to rule out or exclude. Because no single test exists to diagnose DLB, a variety of medical, neurological and neuropsychological tests are used to pinpoint it and its possible overlap with other illnesses.

Although Lewy bodies are found in brains of patients with other diseases and because testing will involve several approaches, it is useful to understand what happens to the brain of a person who has DLB. Three significant changes or pathological features are seen in brains afflicted by Dementia with Lewy Bodies:

- The brain's cerebral cortex (the outer layers of the brain) degenerates or shrinks. This can affect reasoning and complex thinking, understanding, personality, movement, speech and language, sensory input and visual perceptions of space. Degeneration also occurs in the limbic cortex at the center of the brain, which plays a major role in emotions and behavior. Lewy bodies form throughout these degenerating cortical areas.
- Nerve cells die in the midbrain, especially in an area that also degenerates in Parkinson's disease, the substantia nigra, located in the brainstem. These cells are involved in making the neurotransmitter (brain messenger) dopamine. Lewy bodies are found in the nerve cells that remain. The midbrain is involved in memory formation and learning, attention, and psychomotor (muscular movement) skills.
- Lesions called Lewy neurites that affect nerve cell function are found in DLB brains, especially in the hippocampus, an area of the brain essential for forming new memories.

None of the symptoms of Dementia with Lewy Bodies is specific only to DLB. To address this problem, an international group of researchers and clinicians developed a set of diagnostic criteria in 1995, called the *Consensus Guidelines*, that can reliably point to DLB:

Must be present:

- Progressive cognitive decline (decrease in thinking ability) that interferes with normal social or occupational activities. Memory problems do not necessarily occur in the early period but will occur as DLB progresses. Attention, language, understanding and reasoning, ability to do arithmetic, logical thinking, and perceptions of space and time will be impaired.

Two of the following are present (one also indicates possibility of DLB):

- Fluctuating cognition: mental problems vary, especially attention and alertness.
- Visual hallucinations: detailed and well-formed visions occur and recur.
- Parkinsonism: motor-related and movement problems appear.

A DLB diagnosis is even more likely if the patient also experiences repeated falls, fainting, brief loss of consciousness, delusions, or is sensitive to neuroleptic drugs that are given to control hallucinations and other psychiatric symptoms. Hearing, smell or touch hallucinations support the diagnosis of DLB.

Finally, the timing of symptoms is a reliable clue: *if both mental and motor symptoms appear within one year of each other, DLB is more likely the cause.* Signs of stroke or vascular dementia usually negate the likelihood of DLB.

It is not presently clear how accurate the clinical diagnosis of DLB is. While some reports suggest the diagnosis can be made with good accuracy, other studies show that it is difficult to accurately diagnose DLB. Nevertheless, other testing should be done to exclude other causes or illnesses such as Creutzfeldt Jakob's or vascular disease. Brain imaging (CT scan or MR imaging) can detect brain shrinkage and help rule out stroke, fluid on the brain (normal pressure hydrocephalus), or subdural hematoma. Blood and other tests might show vitamin B12 deficiency, thyroid problems, syphilis, or human immunodeficiency virus (HIV). Depression is also a common cause of dementia-like symptoms. Additional tests can include an electroencephalogram (EEG) or a spinal tap. Scans using SPECT and PET (Positron Emission Tomography) technology have shown promise in detecting differences between DLB and Alzheimer's disease.

Alzheimer's and Parkinson's: Differences and Overlap with DLB

DLB's similarity to Alzheimer's and Parkinson's diseases and the fact that Lewy bodies are often found in the brains of patients with these diseases means that clinicians must pay close attention to the factors that distinguish DLB:

- Memory and other cognitive problems occur in both DLB and Alzheimer's. However, in DLB they fluctuate frequently.
- DLB patients experience more depression than do Alzheimer's patients.
- Hallucinations are experienced by Alzheimer's patients in late stages, and by Parkinson's patients who take medications to improve movement and tremor. In DLB, hallucinations occur in early stages, and they are frequent, vivid and detailed.
- Neuroleptic drugs (sometimes called psychotropic drugs) prescribed to lessen the so-called psychiatric symptoms of dementia, such as hallucinations, agitation or restlessness will induce Parkinson's in some DLB patients.

- Life expectancy is slightly shorter for DLB than for Alzheimer's patients.
- At autopsy the brains of DLB patients have senile plaques, a hallmark of Alzheimer's. Another Alzheimer's feature, neurofibrillary tangles, are absent or found in fewer numbers and are concentrated in the neocortex. Other Alzheimer's features - regional neuronal loss, spongiform change and synapse loss, neurochemical abnormalities and neurotransmitter deficits - are also seen. However, DLB-afflicted brains are less damaged than are Alzheimer's brains.
- In DLB movement problems are spontaneous; the symptoms begin suddenly.
- Tremor is less pronounced in DLB than in Parkinson's. Also, DLB patients respond less dramatically to drugs such as Levodopa that are used to treat Parkinson's. Nerve cell loss in the substantia nigra is not as severe in DLB.
- Both DLB and Parkinson's patients may sometimes experience fainting and wide alterations in blood pressure.
- Some Parkinson's patients develop dementia in later stages. Dementia is usually the presenting symptom in DLB.
- Parkinson's patients lose the neurotransmitter dopamine; Alzheimer's patients lose the neurotransmitter acetylcholine. DLB patients lose both.
- In DLB, Alzheimer-like and Parkinson-like symptoms appear within one year of each other.

Despite these differences, a diagnosis of Dementia with Lewy Bodies does not preclude a positive diagnosis of Alzheimer's, Parkinson's or other diseases common in older age.

Duration and Treatment

With an average lifespan after onset of 5 to 7 years, the progress of Dementia with Lewy Bodies is relentless, resulting in severe dementia and immobility. DLB does not follow a pattern of stages as is seen in some other dementias. A few patients progress very rapidly through the disease. Death usually occurs from pneumonia or other illness. There is no cure nor specific treatment to arrest the course of the disease.

Caution must be used in treating a person who is suspected of having DLB, again pointing to the need for an accurate diagnosis. Medications must be monitored closely for proper balance because some patients—not all—are adversely affected. Neuroleptic (tranquilizing) anti-psychotic drugs such as haloperidol or thioridazine that are often given to Alzheimer's patients to help lessen symptoms such as agitation or hallucinations can cause extreme adverse reactions in many DLB patients and can bring on motor-related symptoms. A patient treated with these drugs could become catatonic, lose cognitive function and/or develop more muscle rigidity, results that could threaten life. Likewise, levodopa drugs used to treat Parkinson's motor symptoms may increase the hallucinations

of DLB patients and aggravate other symptoms. Levodopa is not usually very helpful in treating the motor symptoms of DLB patients.

Some drug therapies are showing promise, however. Cholinesterase inhibitors, such as Tacrine, may be an alternative treatment and have been effective in stopping hallucinations. Some newer antipsychotic drugs (seroquel, sertindole) may be safe.

DLB patients can live at home with frequent reassessment and careful monitoring and supervision. Caregivers must watch them closely because of the tendency to fall or lose consciousness. Dementia prevents patients from learning new actions that might help them overcome movement problems. They may need more assistance some days than others, and can be reassured by a caregiver's help in turning attention away from hallucinations. Caregivers can turn to a regional Caregiver Resource Center in California for assistance, and to a qualified diagnostic center for initial diagnosis and follow-up. In other states, resources can be found through local and state offices on aging and health.

Credits and References

LewyNet, The University of Nottingham, Division of Pathology, University Park, Nottingham, England NG7 2RD. Telephone +44 115 9515151.

Web site: www.ccc.nottingham.ac.uk/~mpzjlowe/lewy/lewyhome.html.

“Dementia with Lewy Bodies: A Distinct Non-Alzheimer Dementia Syndrome?” by Paul G. Ince, Elaine K. Perry, and Chris M. Morris, *Brain Pathology*, April, 1998. (Available with extensive bibliographies at LewyNet web site.)

“Similarities to Alzheimer’s and Parkinson’s Make Lewy Body Dementia Difficult to Recognize and Challenging to Treat,” *John Douglas French Center for Alzheimer’s Disease Journal*, 1998/1999.

Parkinson’s Disease UPDATE, a monthly newsletter, Medical Publishing Company, P.O. Box 450, Huntingdon Valley, PA 19006. Issue #10, 2000.

“Dementia with Lewy Bodies” by Ian G. McKeith, M.D., FRCPsych., *High Notes*, News from the John Douglas French Alzheimer’s Foundation, Fall, 1996.

“Consensus guidelines for the clinical and pathological diagnosis of dementia with Lewy bodies (DLB): report of the consortium on DLB International Workshop,” by I. G. McKeith, D. Galasko, K. Kosaka, E. K. Perry, et al, 1996. *Neurology*, 47:1113-24.

Dementia with Lewy Bodies by Robert H. Perry, Ian G. McKeith, and Elaine K. Perry (editors), Forward by Jeffrey L. Cummings, 1996. Cambridge University Press, Cambridge.

Other References

Ala, T. A., Yang, K. H., Sung, J. H., Frey, W. H., 1997. Hallucinations and signs of parkinsonism help distinguish patients with dementia and cortical Lewy bodies from patients with Alzheimer's disease at presentation: a clinicopathological study. *Journal of Neurology, Neurosurgery and Psychiatry*, 62:16-21.

Dickson, D. W., Ruan, D., Crystal, H., Mark, M. H., et al, 1991. Hippocampal degeneration differentiates diffuse Lewy body disease (DLBD) from Alzheimer's disease. *Neurology*, 41:1402-9.

Galasko, D., Katzman, R., Salmon, D. P., Hansen, L., 1996. Clinical features and neuropathological findings in Lewy body dementias. *Brain Cognition*, 31:166-75.

Graham, C., Ballard, C., Saad, K., 1997. Variables which distinguish patients fulfilling clinical criteria for dementia with Lewy bodies from those with dementia, Alzheimer's disease. *International Journal of Geriatric Psychiatry*, 12:314-8.

Hansen, L. A., Samuel, W. 1997. Criteria for Alzheimer's disease and the nosology of dementia with Lewy bodies. *Neurology*, 48:126-32.

Ince, P., Irving, D., MacArther, F., Perry, R.H., 1991. Quantitative neuropathology of the hippocampus: comparison of senile dementia of Alzheimer type, senile dementia of Lewy body type, Parkinson's disease and non-demented elderly control patients. *J Neurol Sci*, 106:142-52.

Ince, P. G., McArthur, F. K., Bjertness, E., Torvik, A., et al, 1995. Neuropathological diagnoses in elderly patients in Oslo: Alzheimer's disease, Lewy body disease and vascular lesions. *Dementia*, 6:162-8.

Klatka, L. A., Louis, E. D., Schiffer, R. B., 1996. Psychiatric features in diffuse Lewy body disease: a clinicopathological study using Alzheimer's disease and Parkinson's disease. *Neurology*, 47:1148-52.

Kosaka, K., Iseki, E., Odawara, T., et al, 1996. Cerebral type of Lewy body disease. *Neuropathology*, 16:32-5.

Louis, E. D., Klatka, L. A., Lui, Y., Fahn, S., 1997. Comparison of extrapyramidal features in 31 pathologically confirmed cases of diffuse Lewy body disease and 34 pathologically confirmed cases of Parkinson's disease. *Neurology*, 48:376-80.

McKeith, I. G., Fairbairn, A., Perry, R. H., Thompson, P., Perry, E. K., 1992. Neuroleptic sensitivity in patients with senile dementia of Lewy body type. *British Medical Journal*, 305:673-8.

Mega, M. S., Masterman, D. L., Benson, D. F., Vinters, H. V., et al, 1996. Dementia with Lewy bodies: reliability and validity of clinical and pathological criteria. *Neurology*, 47:1403-9.

Perry, E. K., Haroutunian, V., Davis, K. L., Levy, R., et al, 1994. Neocortical cholinergic activities differentiate Lewy body dementia from classical Alzheimer's disease. *Neuroreport*, 5:747-9.

Salmon, D. P., Glasko, D., Hansen, L. A., Masliah, E. et al, 1996. Neuropsychological deficits associated with diffuse Lewy body disease. *Brain Cognition*, 31:148-65.

Samuel, W., Alford, M., Hofstter, C. R., Hansen, L., 1997. Dementia with Lewy bodies versus pure Alzheimer's disease: differences in cognition, neuropathology, cholinergic dysfunction, and synaptic density. *Journal of Neuropathology and Experimental Neurology*, 56:499-508.

Resources

Los Angeles Caregiver Resource Center

3715 McClintock Avenue

Los Angeles, CA 90089-0191

(800) 540-4442 (in CA) or (213) 821-7777

Web Site: www.losangelescrc.org

E-mail: lacrc@usc.edu

The Los Angeles Caregiver Resource Center serves family caregivers of a brain impaired or frail, older adult through education, research, services and advocacy. For residents of the Los Angeles County Area, LACRC provides direct family support services for caregivers of those with Alzheimer's disease, stroke, traumatic brain injury, Parkinson's, ALS, Multiple Sclerosis, Huntington's disease and other debilitating brain disorders that strike adults.

Family Caregiver Alliance

180 Montgomery Street, Suite 1100

San Francisco, CA 94104

(415) 434-3388 or (800) 445-8106 (Toll Free in CA)

Web Site: www.caregiver.org

E-mail: info@caregiver.org

Reviewed by William Jagust, M.D. Prepared by Family Caregiver Alliance in cooperation with California's Caregiver Resource Centers, a statewide system of resource centers serving families and caregivers of brain-impaired adults. February, 2001. Funded by the California Department of Mental Health. © 2001 All rights reserved.