An unusual cause of acute-onset and progressively worsening visual loss is presented. A 60-year-old woman was referred for left homonymous hemianopsia to our Emergency Medicine Department because of a suspected vascular accident. Ten years earlier she had been diagnosed as having chronic lymphocytic leukemia. Brain computed tomography and magnetic resonance imaging revealed “bilateral foci of white matter abnormalities in the occipital regions, compatible with a diagnosis of progressive multifocal leukoencephalopathy”. Her cerebrospinal fluid was positive for papovavirus JC. Progressive multifocal leukoencephalopathy due to papovavirus JC, a typical complication in AIDS patients, is a rare complication in patients with other immuno-suppressive conditions, such as chronic lymphocytic leukemia.

**Key words:** AIDS; Cerebrospinal fluid; Chronic lymphocytic leukemia; Papovavirus JC; Progressive multifocal leukoencephalopathy.
Lumbar puncture yielded a clear, normal-pressure CSF with glucose and protein levels normal with respect to the plasma values and 3 lymphocytes/mm³. Polymerase chain reaction (PCR) examination of the CSF for the presence of JC virus yielded a positive result.

On the basis of the FLAIR-MRI and CSF findings a diagnosis of PML was made.

During the following weeks, the patient completely lost her vision and developed left hemiparesis and her conditions progressively worsened. She was finally transferred to the Infectious Disease Department and during the following months she developed tetraparesis, progressive mental impairment and coma. The patient died 8 months after the diagnosis was made.

Discussion

CLL is the most prevalent leukemia in western countries. Symptomatic central nervous system involvement with CLL has been reported to occur in < 1% of cases while PML is one of the opportunistic infections of the central nervous system in patients with CLL.

PML, first recognized in 1958 in a patient with chronic lymphocytic leukemia, was a relatively rare condition prior to the emergence of AIDS and today it is mandatory to rule out PML in AIDS patients with focal brain symptoms.

In 1971, Padgett et al. reported the cultivation of a papova-like virus from human brain cells with PML and that virus was called JC (JC are the initials of the patient from whom the first virus isolates were obtained). JC is a polyomavirus and, as such, is a member of the Papovaviridae family. These are small, non-enveloped viruses with a covalently closed, circular, doubled-stranded DNA genome. JC virus infection is ubiquitous and it is thought to be asymptomatic in immunocompetent individuals.

It is still being debated whether PML is due to reactivation of a latent childhood JC virus infection of the central nervous system, or to a cerebral primary infection in an immunocompromised host.

Several cases have been reported in association with leukemia and lymphomas, cancer chemotherapy and immunosuppressive treatment.

A definitive diagnosis of PML requires evaluation of the brain tissue, but recent studies indicate that the presence of JC virus in the CSF may be identified by PCR with a high specificity and sensitivity.

The neuroimaging characteristics of PML are a decreased attenuation on computed tomographic scans and a hyperintense signal on T2-weighted MRI. The lesions most often involve the periventricular and subcortical white matter of the occipitoparietal or frontal lobes. Occasionally, the posterior fossa is involved too. Rarely, the lesions show contrast enhancement or produce a mass effect.

In a prospective cohort study of AIDS patients with focal brain lesions, the absence of a mass effect on neuroimaging studies and a positive PCR testing for JC virus in the CSF yielded a 0.99 probability of making a diagnosis of PML.

As in our patient, computed tomography of the brain shows hypodense, non-enhancing lesions of the cerebral white matter and the lesion extension is often less than would be expected on the basis of the neurological symptoms. MRI, which proves to be more sensitive, typically shows high intensity abnormalities in the white matter in T2-weighted and fluid-attenuated inversion recovery imaging.

Figure 1. Magnetic resonance imaging axial fluid-attenuated inversion recovery image showing bilateral hyperintense signals in the white matter of the occipital lobes with sparing of the gray matter and no mass effect.
images and low intensity abnormalities in T1-weighted images, not enhanced after gadolinium and with no mass effect. This characteristic helps to differentiate PML from lymphomatous infiltration of the central nervous system.

The clinical manifestations of PML include visual deficit, upper motor neuron weakness, and an altered mental state. Language and speech dysfunction, extrapyramidal syndromes, cerebellar disorders, sensory deficits, headaches, and seizures may also occur. Most commonly the patient’s conditions deteriorate rapidly, and death usually occurs within 6 months of the diagnosis.

PML may be distinguished from central nervous system lymphocytic infiltration and from encephalitis caused by other viruses on the basis of the MRI pattern (sparring of the cortical gray matter, no enhancement after gadolinium) by the normal or near normal characteristics of the CSF and by evidence of JC virus in the CSF at PCR analysis. This method can obviate the need of brain biopsy, allowing the detection of the viral sequences in > 85% of cases, with no false positive results. A positive result has to be considered diagnostic only when associated with characteristic findings on clinical and radiographic examinations, while a negative result does not exclude the diagnosis when these findings are present.

Unfortunately, no treatment is currently available for this complication. A few reports refer a somewhat delayed progression of the disease after cidofovir therapy.

Physicians must consider carrying out a PCR test for JC virus DNA on the CSF to rule out the diagnosis of PML in patients with CLL or an immunodeficiency state with characteristic findings on clinical and radiographic examinations, while a negative result does not exclude the diagnosis when these findings are present.

Unfortunately, no treatment is currently available for this complication. A few reports refer a somewhat delayed progression of the disease after cidofovir therapy.

In this clinical setting, clinicians need to keep immunodepression-related infectious processes high in the list of probabilities, with PML ranking at the first place.

**Riassunto**

Viene presentata una rara causa di perdita progressiva del visus ad insorgenza acuta. Una donna di 60 anni, con storia di leucemia linfatica cronica da circa 10 anni, venne inviata in Pronto Soccorso per la comparsa improvvisa di un’emianopsia omonima nel sospetto di un accidente cerebrovascolare. Una tomografia assiale computerizzata e una risonanza magnetica nucleare mostrarono lesioni della sostanza bianca bilaterale nelle regioni occipitali compatibili con leucoencefalopatia multifocale progressiva. Un esame del liquido cerebrovascolare risultò positivo per il papovavirus JC. La leucoencefalopatia multifocale progressiva dovuta al virus JC è una tipica complicanza del paziente affetto da AIDS, ma è presente anche in altre condizioni di immunodepressione come la leucemia linfatica cronica.

**Parole chiave:** AIDS; Leucemia linfatica cronica; Leucoencefalopatia multifocale progressiva; Liquor cerebrospinale; Papovavirus JC.

**References**


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