Case Report

Cerebral amyloid angiopathy presenting as a posterior leukoencephalopathy: A case report and review of the literature

Boby Varkey Maramattom, Leena Varkey Maramattom
Department of Neurology, Indo-American Hospital Brain and Spine Center, Vaikom, USA.

Cerebral amyloid angiopathy (CAA) is well known to present with lobar intracerebral hemorrhage, dementia or transient neurological events. White matter changes with CAA have only been recently described and can be seen with either sporadic or familial CAA. We present a 50-year-old man with rapidly progressive dementia in whom MRI brain showed symmetrical white matter changes in the parieto-occipital regions. Brain biopsy revealed changes of CAA along with features of Alzheimer’s disease. Immunohistochemistry revealed amyloid beta protein. The subcortical lesions were thought to occur from hypoperfusion of the distal white matter. The role of amyloid in the pathogenesis of CAA and the mechanism of leukoencephalopathy are discussed.

Key Words: Cerebral amyloid angiopathy, Subacute dementia, Posterior leukoencephalopathy, Parieto-occipital white matter hyperintensity.

Introduction

Cerebral amyloid angiopathy (CAA) commonly presents with lobar intracerebral hemorrhage (ICH) in the elderly. Other manifestations such as cerebellar hematomas, dementia, TIA, seizures and cerebral vasculitis have been described although they are unusual. Dementia can result from the recurrent lobar hemorrhage or can occur due to a coexistent Alzheimer’s disease (AD) in 80% of cases. However dementia with profound white matter changes resulting from CAA is unusual and has not been described from India before. We present a case of CAA that presented with posterior lobar white matter changes (leukoencephalopathy) and subacute dementia and review proposed mechanisms.

Case Report

A 50-year-old man developed progressive dementia over 6 months. His symptoms started with mood fluctuations and forgetfulness. He rapidly progressed to total dependency over 2 months. MRI brain showed symmetrical hyperintensities over the parieto-occipital white matter.

There was no past history of diabetes, hypertension, renal failure, exposure to toxic chemicals, radiation, or drugs. Family history was noncontributory. He scored 3/30 on his mini mental status examination (MMSE) and there were no long tract signs.

Routine blood exam, metabolic and endocrine workup, HIV, VDRL, RA factor, ANA, p-ANCA, chest X-ray, ECG, EEG, nerve conduction study (NCV) and CSF studies were normal. An MRI after 4 months, showed increasing white matter changes. A stereotactic brain biopsy from the parieto-occipital area revealed congophilic amyloid material deposited on the walls or arterioles and medium sized muscular arteries in the grey matter and meninges. Scattered amyloid rich diffuse plaques were seen in the neuropil. Immunohistochemistry showed strongly amyloid beta protein (A beta) positive deposits in the vessel walls. Beta amyloid plaques were also present in the adjacent cortex. Some neuritic plaques, dystrophic neuritis and neurofibrillary tangles (NFT) were also seen in the cortical layers. The above histology suggested CAA with co-existing Alzheimer pathology. The patient’s family declined further investigations.

Discussion

Cerebral amyloid angiopathy (CAA) refers to pathological changes in cerebral blood vessels due to deposition of amyloid proteins. CAA may be sporadic or familial and is definitively diagnosed only by biopsy. CAA predominantly affects the elderly, over the frontal, parietal, occipital lobes (often severely) and the cerebellar dentate nuclei. The basal ganglia, thalamus, brainstem and white matter are rarely involved.

Amyloid involves cortical capillaries, leptomeningeal and
cortical arteries, arterioles, veins, and venules and occasionally spills out into the surrounding tissues forming plaque like structures (provascular plaques). Age related dystrophic neuritis, senile plaques and neurofibrillary tangles that are less severe than in AD can accompany CAA. Our patient had a pathological combination of CAA and AD due to A beta deposition.

White matter changes (WM changes) have been described with CAA in other circumstances. Familial AD (PS-1 mutations) can be associated with posterior white matter changes. These are initially reversible (vasogenic edema) but later become permanent. They can also appear with dysregulation of the blood-brain barrier (BBB) caused by A beta deposition in vessels. This impairs brain metabolism, homeostasis, nutrient delivery, and cerebral blood flow. Such vessels are less responsive to changes in blood pressure and less capable of repair or regeneration after injury. In CAA, hypertension can predispose to a reversible posterior leukoencephalopathy (RPLE). In our patient, familial AD with PS-1 mutation cannot be excluded although the clinical picture and late onset make this unlikely. The absence of hypertension and progressive changes on serial MRI rule out an RPLE. In our case it is likely that CAA caused a posterior leukoencephalopathy either by disturbing the cerebral microcirculation or by causing distal white matter hypoperfusion.

**Conclusion**

Cerebral amyloid angiopathy has protean clinical presentations. A posterior leukoencephalopathy with dementia is a rare manifestation, however such findings should raise the question of CAA.

**References**


Accepted on 13.05.2004.