Case Report

Cerebroprotein hydrolysate in treatment of vascular dementia - a case report

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ABSTRACT

Vascular dementia (VD) is a dementia due to vascular factors and is one of common causes of dementia. Neurotrophic factors and anticholinesterases are useful in the management of disorders such as dementia or stroke. A new pharmacological agent called cerebroprotein hydrolysate has been used in the management of dementia with promising results. Here we present a case report where cerebroprotein hydrolysate showed promising improvement in the management of vascular dementia.

Key words: Cerebroprotein hydrolysate, dementia, vascular, vascular dementia.

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INTRODUCTION

Dementia is a neuropsychiatric disorder of late life clinically manifesting as memory loss, cognitive dysfunction and behavioural symptoms that arise due to a neurodegenerative mechanism occurring in the neurons.[1] Of the various causative factors, dementia of Alzheimers type and dementia of vascular origin are the commonest varieties.[2] Dementia has a very relevant impact on the overall wellbeing and quality of life of elder patients as well as caregivers who look after these patients as many cases of dementia are totally dependent on caregivers and cannot take care of themselves.[3]

Vascular dementia (VD) is a form of dementia that arises due to vascular causes like atherosclerosis, hypertension and cardiovascular morbidity including diabetes.[4] Today there are very few treatment modality available for treating vascular dementia in form of anti-hypertensive, anti-coagulant and anti-platelet medications which have minimal effect on neuromodulation and neurogenesis.

Cerebroprotein hydrolysate is a new pharmacological agent which is neurotrophic in nature and produced by standardized enzymatic breakdown of lipid-free porcine brain proteins.[5] It has been shown in various studies to enhance neurogenesis, neuronal survival, neuronal plasticity and also have some neuroimmunotrophic mechanism of action.[6] For these beneficial effects of cerebroprotein, patient and relatives must be completely informed about advantages and probable side effects and consent must be taken before starting cerebroprotein intervention. It is given in a dose of 60 -180 mg once daily for 10 - 20 days. It should be slowly perfused in 250 ml saline in 60 - 120 minutes. Maintenance doses (30 mg) can be given by intramuscular route.[7]

We in our experience have had some cases where the authors have used cerebroprotein with promising results in the management of dementia.[7-8] We describe here a case of vascular dementia that showed good results when administered cerebroprotein hydrolysate treatment.

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CASE REPORT

An 85 year old married Gujarati male, having studied till the 8th standard and retired since the last 20 years, married, presented to the out patient department psychiatry with chief complaints of forgetfulness in day to day activities, altered behavior and aggression, passage of urine and stools in clothes and reversal of sleep wake pattern. The total duration of symptoms was 2-3 years and it had increased since last 2 months.

The patient was apparently alright 2 years back when he had complaints of forgetfulness in his daily activities in form of not able to perform household activities, difficulty in handling small sums of money and difficulty to remember the tasks which he was supposed to do. He was also unable to recall recent events like visitors at home, the food he had consumed and whether he had brushed his teeth or bathed or not. Occasionally he would also have difficulty remembering his way back to home and would lose his way and used to be brought home by people in the locality who knew him. The patient also had increased irritability along with angry abusive behavior towards family members. He started refusing to take a bath or change his clothes.

He also started making incessant demands like a small child for sweets and chocolates as well some expenses which were not in keeping with the financial status of his family. The patient also had difficulty controlling his emotions and would cry or laugh easily on being provoked and even without reason. He also showed regressive behavior in the form of passing stools and urine in clothes or in any room of the house on the floor. The patient also had disinhibited behavior in form of removing all the clothes in front of family members. The patient would also suspect that people were planning to harm him for his property and would wander out of home aimlessly without informing family member in an unkempt condition. He would collect garbage, food wrappers and papers and would bring it to home. He had decreased sleep being awake the whole night till 5am and sleeping from 6 am to 1 pm. All above complaints were gradually increasing over a period of 2-3 years and were aggravated in a period of the last 2 months.

The patient had a history of diabetes which was controlled and ischemic heart disease and was on oral medication for the same. Recent magnetic resonance imaging study of the brain revealed multiple lacunar infarcts and generalized cerebral atrophy with white matter hyperintensities as well. There was no history suggestive of psychiatric illness in his family. There was no history suggestive of dementia as well in the family.

On admission, the patient had a score of 15 on the Blessed Dementia Scale and a score of 7 on Hachinski Ischemia Scale. Both scores suggested Vascular Dementia. He also fulfilled the ICD-10 criteria for vascular dementia. The patient was admitted to the psychiatry ward for further management and all routine blood investigations were within normal ranges. On the 3rd day of admission the patient had a score of 7 on Mini Mental Status Examination (MMSE).

The patient was started on quetiapine 50 mg at night for sleep along with donepezil 10 mg per day and Piracetam 2400 mg per day in divided doses. The patient showed no improvement over a week and cerebroprotein therapy was suggested to the relatives. After taking a complete informed consent for starting cerebroprotein to the patient, the patient was started on cerebroprotein hydrolysate 60 mg daily on slow infusion intravenously. After 7 infusions the patient had score of 14 on MMSE. The patient was given a total of 15 doses and he showed an improvement with MMSE score being 20 and Blessed dementia score reduced to 7. 15 doses is the standard regimen for cerebroprotein.[8]

He started recalling recent events, interpreting surrounding and finding way on his own, improved behaviorally, improved sleep awake cycle and developed bladder and bowel control which was a big relief for the relatives. He however had to take premature discharge to attend a family event and was lost to follow up. They were advised to continue all oral medical therapy.

DISCUSSION

There have been no recent and effective breakthrough from a psychopharmacological perspective when it comes to the management of vascular dementia. Cerebroprotein hydrolysate due to its neurotrophism shows some promise and may help in improving various symptoms of dementia.[9] Till the recent past it was believed that there is no way to repair a damaged neuron.

One of the main goal of researchers is to develop drugs to stimulate areas of brain to repair itself by replacing its own cells. Neurotrophic factors are small protein that exert survival promoting and trophic action on neuronal cells. These neurotrophic factors are NGF (nerve growth factor), BDNF (brain-derived neurotrophic factor), NT-3 (neurotrophin-3), GDNF (glial cell-derived neurotrophic factor), GAP-43 (growth associated protein 43) and CNFT (cilliary neurotrophic factor). Studies demonstrate that neurons in the adult brain have an unappreciated capacity for remodeling away from the actual injury and that these neurons are attempting to re-wire the brain following an injury.

Cerebroprotein hydrolysate is the latest weapon in the physician's armamentarium. It is a neurotrophic drug. It consists of short biological peptides which act like endogenous neurotrophic factors. Neurotrophic activity can be detected upto 24 hours after a single injection. Cerebroprotein hydrolysate has been shown to counteract the negative effect of the elevated FGF-2 on neurogenesis and neuromodulation. This could be the mechanism for its beneficial effect in Alzheimer's disease. Cerebroprotein hydrolysate augmented proliferation, differentiation, and migration of adult SVZ neural progenitor cells results in increased number of neural progenitor cells and neuroblasts to contribute to neurogenesis. This may be the mechanism for its beneficial effect in acute ischaemic stroke and traumatic brain injury.

Enhancement of neuronal survival is produced through effect on calpain. The hyper-activation of calpain is implicated in a number of neurodegenerative disorders. Calpain is inhibited by Cerebroprotein hydrolysate. Neuromodulatory effect is produced by increasing GLUT-1 expression which is responsible for more than 90% of glucose transport to brain. Neuronal plasticity is produced by reduction of amyloid beta accumulation, increased MAP 2 and synaptophysin synthesis. Neuro-immunotrophic activity is produced by inhibition of microglial activation and expression of IL-1 beta. This results in reduction of inflammation. This drug can be given with other neuroprotective agents like edaravone, citicoline, and piracetam safely.[10]

Other neurotrophic drugs and nootropics are not having as much broad spectrum of different actions as possessed by cerebroprotein hydrolysate. The patients of neurodegenerative disorders can now be managed in a better way with the advent of cerebroprotein hydrolysate. Even some improvement in cognitive function, self care, memory and bowel and bladder control goes a long way to enhance the quality of life for both the dementia patient and the caregiver.

Cerebroprotein hydrolysate is however still in its nascent stage and will need rigorous randomized controlled trials before its efficacy is established. Case reports are present where cerebroprotein hydrolysate had shown improvement in patients with traumatic brain injury, extra pontine myelinosis and vascular dementias.[9-11]

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