

CLINICAL PRACTICE GUIDELINES FOR TREATMENT OF VASCULAR DEMENTIA

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Definition :

Vascular dementia includes abrupt cognitive decline and step wise deterioration, presence of dementia, evidence of cerebrovascular disease on brain imaging, focal signs of cerebrovascular disease and temporal relationship between stroke and dementia.

Epidemiology:

- Vascular dementia is the second most common cause of dementia in the United States and Europe, but it is the most common form in some parts of Asia.
- No Indian data available. The prevalence of Diabetes is 7-10 % after 40 years; more in south (8-10%) than north (3-5%) (*Gupta,2006*). Hypertension is 25-30% at 20 years; roughly same percentage as age : 40% at 40 years, 50% at 50 years and so on (*Mohan,2006*). Hypertension and diabetes are the most important risk factors for VaD and high prevalence of these indicate high prevalence of VaD in India.
- Hypercholesterolemia (LDL>130) in 7-8% Indians. It is also a high risk factor, (*Gupta, 2006*) and indicates high prevalence of VaD.
- The prevalence rate of vascular dementia is 1.5% in Western countries and approximately 2.2% in Japan.
- A Swedish study estimated the lifetime risk of VaD as 34.5% for men and 19.4% for women (*Hagnell et al,1992*)
- In community-based studies, the incidence of VaD has ranged from 0.17 to 0.71 per 100 person-years.
- In a sample of hospitalised ischaemic stroke patients, the incidence of VaD was estimated to be 8.4 per 100 person-years.
- **Rotterdam Scan Study (Otta, et al.1995)**
 - 6.3 % of participants (55-106 years) met the criteria for dementia
 - Frequency increased exponentially to 43.2% at age 95 years and above
 - Alzheimer's predominant diagnosis in western population (AD -72%; VaD-16%)
 - Vascular dementia more common in eastern population (Japan, China, Russia, ?India)
 - Vascular cognitive impairment with no dementia (CIND) 8.4% in men & 12.5% in women – Italian population (65-84 years) (*Di Carlo et al,2000*)

Risk Factors (causes) for VaD:

Risk factors for vascular dementia include hypertension, hypercholesterolemia, obesity, smoking, diabetes mellitus, and cardiovascular and cerebrovascular disease. Low levels of folate, Vitamin B-6 and Vitamin B-12 are associated with increased homocysteine levels, which is a risk factor for stroke.

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The Risk factors for vascular dementia are tabulated in Table -I (Sachdev, 1999)

TABLE -I	
• Sociodemographic	
Age	Increasing incidence with age, especially after 60 years
Race/ethnic	Higher rates in Asian and black populations
Sex	Higher rates in men
Education	May have a protective effect
• Atherogenic	
Hypertension	Major risk factor
Coronary artery disease	Increases stroke risk
Diabetes mellitus	Risk factor for stroke
Cigarette smoking	Risk factor for stroke
Hypercholesterolaemia	Risk factor for stroke
Fibrinogen, obesity	Evidence lacking
• Other cardiovascular	
Atrial fibrillation	Risk of cerebral embolism
Mitral valve prolapse	Cerebral embolism
Peripheral vascular disease	Inconsistent evidence
• Other factors	
Genetic	Weak; CADASIL* an exception
Apolipoprotein E polymorphism	Evidence inconsistent
Anticardiolipin antibodies	Evidence inconsistent
Alcoholism	Evidence inconsistent
• Stroke-related	
Number, volume, location of stroke	Consistent evidence for VaD
Strategic silent infarcts	Important for VaD
Pre-existent atrophy	Important for VaD.
Presence of abnormal periventricular signal on magnetic resonance imaging, or (especially) on computed tomography	Favours VaD
* CADASIL = cerebral autosomal dominant arteriopathy with subcortical infarct and leukoencephalopathy	

Clinical signs and symptoms:

- Impairment in recent memory, (memory deficits less than AD)
- Abnormal executive functioning (difficulty with tasks that require conscious control and planning)
- Impaired psychomotor performance
- Changes in personality and mood, (personality better preserved c.f AD)
- Disturbances in gait (slow and unsteady)
- Hyperreflexia, extensor plantar response
- Urinary incontinence
- Hemiparesis, including lower facial weakness
- Hemisensory deficits
- Visual problems (field defect, diplopia)
- Pseudobulbar syndrome (eg. dysarthria, dysphagia, emotional incontinence)

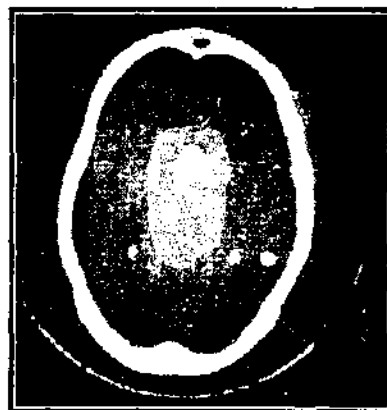
Clinical features of both Alzheimer's and Vascular Dementia are tabulated in Table 2.11
 Alzheimer's versus Multiinfarct Demetia : Comparison of clinical characteristics:

TABLE -II

Characteristics	Alzheimer's Disease	Multiinfarct Dementia
Demographic		
• Sex	Women more commonly affected	Men more commonly affected
• Age	Generally over age 65 years	Generally over age 55 years
History		
• Time course of deficits	Gradually progressive	Stuttering or episodic, with stepwise deterioration
• History of hypertension	Less common	Common
• History of stroke(s), Transient ischemic attack(s) or other focal neurological symptoms	Less common	Common
Examination		
• Hypertension	Less common	Common
• Focal neurological signs	Uncommon	Common
• Signs of atherosclerotic cardiovascular disease	Less common	Common
• Emotional lability	Less common	More common
• Cognitive deficits	Uniform	Patchy in nature



AD



VaD

DIAGNOSIS :

• DSM-IV-TR (APA, 2000)

- The development of multiple cognitive deficits is manifested by the following both
- Memory impairment
- One or more of the following cognitive disturbances:
 - aphasia
 - apraxia
 - agnosia
 - disturbance in executive functioning
- Above cognitive deficits cause significant impairment in social or occupational functioning
- Evidence of significant cerebrovascular disease as by lab evidence or focal neurological signs and symptoms
- Deficits do not occur exclusively during course of delirium

• ICD-X (WHO, 1992)

- Presence of Dementia
 - Evidence of a decline in both memory and thinking which is sufficient to impair personal activities of daily living
 - The impairment of memory affects the registration, storage and retrieval of new information
 - Presence of clear consciousness
 - Above impairments should be evident for at least 6 months
- Uneven impairment of cognitive function
- Insight and judgement well preserved
- An abrupt onset or a step wise deterioration with focal neurological signs & symptoms, increase possibility of diagnosis
- Confirmation by CT scan or neuropathological examination

Neuropathology (Ellison & Love, 1998)

- Localized or generalized cerebral atrophy but less than in AD and infarctions with areas of softening and scarring
- Thickened adherent meninges, at times subdural hemorrhage
- Dilated ventricles, cyst formation evident to naked eye
- Main arteries at base of brain are thickened, tortuous and rigid with yellowish patches
- Arterial lumen – reduced or obliterated by intimal thickening and subintimal atheromatous plaques
- The appearance depends upon nature of vascular insult (ischaemia, haemorrhage or edema) eg. Lacunar infacts show small cavity up to 1.5 cm in diameter in basal ganglia, thalamus, pons, internal capsule etc.

Neurohistology (Lischman, 1987)

- Loss and chromatolysis of nerve cells.
- Irregular patches of demyelination in white matter.
- Small scattered infarcts - appear as cyst formation & reactive gliosis
- Lacunar states – seen as multiple cavities with irregular contours.
- Larger infarcts – appear as necrotic degeneration with masses of granular phagocytes. Later, dense glial and fibrotic infiltration and distortion of brain substance.

Neuroradiology (Osborn, 1995)

- No single pathological feature; combination of infarcts, ischaemia and atrophy present
- Atrophy of Hippocampus, Parahippocampal gyrus, Dentate gyrus, subiculum
- Enlargement of the transverse fissure of Bichat
- Hyperintensities of Hippocampal gyrus
- Vascular Dementia resulting from single, strategically placed infarcts are important as damage in critical locations such as the anteromedial thalamus can cause significant disability

Complications in VaD:

- Behavioural problems, including wandering, delusions, hallucinations and poor judgment
- Depression
- Falls and gait abnormalities
- Aspiration pneumonia
- Decubitus ulcers
- Care giver burden and stress

Safety issues:

- Home safety (leaving fires or doors open)
- Outdoor safety (getting lost and road safety)
- Financial safety (Inability to handle money and poor decision making)
- Work safety (working with dangerous machines)

Vulnerability to:

- Abuse by others – physical, sexual, emotional and financial
- Self neglect – including not eating, squalor

Assessment of VaD:

- Assessment of a patient with suspected vascular dementia should include:
 - (1) establishment of the diagnosis of dementia,
 - (2) identification of the extent and severity of cognitive impairment,
 - (3) determination of the presence of risk factors,
 - (4) documentation of evidence of cerebrovascular disease,
 - (5) determination of the etiologic role of cerebrovascular disease, and
 - (6) evaluation of the functional status of the patient and the interpersonal and community supports available.

Investigations:

- Performed to rule out other causes of dementia

ROUTINE TESTS

- CBC count
- ESR
- Glucose level
- Renal and liver function test
- Serologic tests for syphilis
- Red blood cell folate levels
- Thyroid function test
- Urine analysis

WORTH CONSIDERING

- Syphilis serology
- HIV status
- Chest radiograph
- ECG
- CT or MRI brain scan
- Electroencephalogram
- Neuropsychological assessment

Management:

- **General Principles:** (*Jacques, 1992*)

1. Set reasonable goals – taking into consideration patient's baseline functioning and present deficits.
2. Establish priorities – ascertain biggest problems causing most distress to patient and his family.
3. Decide who is to carry out management – team work, fair work sharing, enthusiasm, willingness and patience needed.
4. Call in expert help when needed –e.g. expert nursing, physiotherapy, speech therapy or medical help.
5. Engage family in treatment plans – to manage behavioural problems, emotional disturbances, physical problems like incontinence.
6. Set a time scale – for each problem so planning ahead can be done and a date for reassessment set.
7. Record what is decided – problem list to be made

- Accurate record of decisions
- Reminds people of responsibilities
- Allows clear reassessment

Date	Problem	Action	By whom	Date of review	outcome

- **Specific Management :**

- **Medical management:** (*Kannayiram A, 2005*) :

1. The mainstay of management of VaD is the prevention of new infarcts /ischaemia/ strokes. This includes administering **antiplatelet** drugs and controlling major vascular risk factors.
 - Studies show antiplatelet drugs are useful in preventing recurrent strokes and other vascular events.
 - Aspirin has positive effects on cognitive deficits. It may also have some neuroprotective effects.
 - Ticlopidine and Clopidogrel may also be used.
2. **Hemorrhological** agents like Pentoxifylline and related drug, Propentofylline help in preventing further damage once stroke has occurred.
3. **Vasodilators** (eg, hydergine [co-dergocrine mesylate; other alkaloids and cyclandelate) have some positive effects.
4. **Neuroprotective** agents which preserve existing tissue are under study like nimodipine, propentofylline and posatirelin. They may be useful for vascular dementia.

- **Psychiatric management: (Fleminger, 2000)**

1. Cognitive symptoms:
 - Acetylcholinesterase inhibitors (Donepezil, Rivastigmine, Galantamine) are used for mild to moderate cases.
 - NMDA antagonist (Memantine) may be used for moderate to severe cases.
 - Vitamin E may slow the rate of functional decline in moderate cases.

2. Non-cognitive symptoms

- **Agression and agitation**

- **- Carry out assessment for –**

- Extent of brain insult
- Delirium
- Pain
- Fear
- sleep loss
- constipation
- cold
- hunger
- medical problems
- Alcohol or other substance abuse.

- **- Psychosocial assessment/ management –**

- Change in environment
- Avoid over stimulation

- Calm predictable routine helpful
- Proactive nursing
- Avoid confrontation
- Short physical restraint
- Anger management
- Music therapy

- Drug treatment :

Brief sedation with medications – like Haloperidol in low doses (Devanand, Marder, et al 1998)

• **Wandering :**

- Risk Assessment – to assess road safety, ability to find their way back
- Identify causes / motivation for wandering
- Use of additional locks or safeguards
- Identification bracelets
- Hospitalization
- Detention under the Mental Health Act, 1987 may need to be considered

• **Mood disturbance**

- Depression :

- Assessment

- for risk factors of depression, e.g. a recent bereavement, general medical condition, any drugs causing depression
- Addressal of psychosocial issues
- Support services
- Leisure activities
- Housing
- Antidepressant medications – main therapeutic strategy
- Newer agents with less anticholinergic activities and less cardiotoxicity preferred
- Citalopram , moclobemide evaluated and found effective (Roth, 1996)

• **Psychotic symptoms :**

- Risk assessment of psychotic symptoms
- Psychosocial measures need to be considered
- Few data on use of antipsychotic drug available
- Choice of drug determined by side- effect profile

• **Sleep disturbance :**

- Assessment of cause – sleep-wake cycle reversal, restless legs, sleep apnoea, depression
- Explanation of sleep hygiene measures
- Hypnotics – little evidence as to which hypnotic to be selected

• **Incontinence :**

- Assessment of causes – urinary tract infection, constipation, medications
- Toilets should be easily identifiable
- Clothing should be easy to remove

v **Rehabilitation :**

- In consonance with the physical and psychological deficits.

References :

1. Gupta R(2006) Burden of coronary heart disease in India ; Monilek Hospitaland Research Center, Jawahar Nagar, Jaipur (Downloaded from Internet)
2. Mohan JC (2006) Prevalence, Awareness, Treatment, Control, and Risk factors of Hypertension in India and its Neighborhood: Newer Data and Older Perspective. Indian Heart J;58:7-9.
3. Hagnell O, Franck A, Grasbeck et al. Vascular dementia in the Lundby study : A prospective, epidemiological study of incidence and risk from 1957-1972.Neuropsychobiology 1992;26:43-49
4. Otta A, Breteler MM, van Harskamp F,et al. (1995) Prevalence of Alzheimer's disease and vascular dementia : association with education. The Rotterdam study. BMJ;310 (6985):970-3
5. Di Carlo, A.,Baldereschi, M.,Amaducci, L.,Maggi,S., Grigoletto,F.et al.(2000). Cognitive impairment without dementia in older people: Prevalence, vascular risk factors, impact on disability: The Italian Longitudi.ial Study on Aging. Journal of the American Geriatrics Society, 48, 775-782
6. Sachdev PS, Brodaty H, Looi JC. Vascular dementia: diagnosis, management and possible prevention. Med J Aust 1999;170(2):81-5
7. Ellison & Love (1998). Neuropathology. Mosby International.
8. Lischman, (1987) Organic Psychiatry. Blackwell.
9. Osborn (1995) Diagnostic Neuroradiology. Harcourt Brace & Company.
10. Jacques A (1992) Understanding Dementia. 2nd ed. Churchill Livingstone.
11. (Kannayiram A, (2005) Department of Medicine, Division of Geriatric Medicine, University of Alberta. (Downloaded from Internet))
12. Fleming (2000) The management of dementia. In New Oxford Textbook of Psychiatry, Ed. Gelder, Gath
13. Devanand, D.P., Marder,K., Michaels, K.S., et al (1998). A randomized placebo-controlled, dose-comparison trial of haloperidol for psychosis and disruptive behaviors in Alzheimer's disease. American Journal of Psychiatry, 155, 1512-20.
14. Roth, M.,Mountjoy,C.Q.,Amrein, R., and the International collaborative study group (1996). Moclobemide in elderly patients with cognitive decline and depression. An International double blind placebo controlled trial, British Journal of Psychiatry, 168,149-57. 1996).