



Review

Vascular cognitive impairment in dementia

Christopher D. Etherton-Beer^{a,b,*}^a Western Australian Centre for Health & Ageing (M573), Centre for Medical Research, University of Western Australia, 35 Stirling Highway, Crawley, WA 6009, Australia^b Department of Geriatric Medicine, Royal Perth Hospital, 197 Wellington Street, Perth, WA 6000, Australia

ARTICLE INFO

Keywords:

Dementia
Vascular
Cerebrovascular disorders
Cerebral infarction
Brain ischaemia

ABSTRACT

Vascular risk factors and cerebrovascular disease are common causes of dementia. Shared risk factors for vascular dementia and Alzheimer's disease, as well as frequent coexistence of these pathologies in cognitively impaired older people, suggests convergence of the aetiology, prevention and management of the commonest dementias affecting older people. In light of this understanding, the cognitive impairment associated with cerebrovascular disease is an increasingly important and recognised area of the medicine of older people. Although the incidence of cerebrovascular events is declining in many populations, the overall burden associated with brain vascular disease will continue to increase associated with population ageing. A spectrum of cognitive disorders related to cerebrovascular disease is now recognised. Cerebrovascular disease in older people is associated with specific clinical and imaging findings. Although prevention remains the cornerstone of management, the diagnosis of brain vascular disease is important because of the potential to improve clinical outcomes through clear diagnosis, enhanced control of risk factors, lifestyle interventions and secondary prevention. Specific pharmacological intervention may also be indicated for some patients with cognitive impairment and cerebrovascular disease. However the evidence base to guide intervention remains relatively sparse.

© 2014 Elsevier Ireland Ltd. All rights reserved.

Contents

1. Introduction	221
2. Methods	221
3. Clinical definitions	221
4. Aetiology and convergence of risk factors for the major dementias	221
5. Epidemiology	221
6. Anatomic and functional correlates	222
7. Clinical correlates and differential diagnosis	222
8. Prevention	223
9. Treatment of vascular cognitive impairment in dementia	224
10. What is the current state of the art?	224
11. Conclusion	224
Contributors	225
Competing interests	225
Funding	225
Provenance and peer review	225
Acknowledgements	225
Appendix A. Supplementary data	225
References	225

* Correspondence to: Western Australian Centre for Health & Ageing (M573), Centre for Medical Research, University of Western Australia, 35 Stirling Highway, Crawley, WA 6009, Australia. Tel.: +61 8 9224 2750; fax: +61 8 9224 8009.
E-mail address: Christopher.etherton-beer@uwa.edu.au

1. Introduction

Ageing populations face an increase in disease burden from chronic neurodegenerative conditions. Dementia will be a major contributor to this increased burden [1]. Cerebrovascular disease is thought to be the second most common cause of dementia and a spectrum of cognitive disorders related to cerebrovascular disease is now recognised [2]. Accordingly, the cognitive impairment associated with brain vascular disease is an increasingly important and recognised area of the medicine of older people. Despite the critical importance of dementia, there is still inconsistent definition of the major sub-types. There is increasing recognition that many, if not most, older people with dementia have mixed, or overlapping, disease due to both vascular and Alzheimer's type changes. However the concept of "mixed dementia" remains variably recognised and operationalised. In this context, the nature, importance and management of vascular cognitive impairment are reviewed.

2. Methods

This narrative review provides a brief overview of traditional teaching, and more recent research findings, relevant to clinical practitioners in the field ordered using a clinical approach. In addition, the "state of the art" was specifically considered in a search of the Medline indexed English language human studies published in the last 12 months (to April 2014) using the search terms "dementia" or "Alzheimer disease", and "cerebrovascular disorders" or "stroke" or "cerebral infarction" or "brain ischemia". Studies not specifically related to the relationship between cerebral vascular disease and cognitive impairment/dementia were excluded, as well as protocol papers and letters.

3. Clinical definitions

Traditional teaching described vascular (or "multi-infarct") dementia as the second leading type of dementia, usually with relatively abrupt onset and stepwise decline, related to multiple large volume or lacunar brain infarcts. Also included were people who may have had fewer strokes, but the strategic position of the lesions(s) and temporal relationship to the onset of cognitive impairment suggested aetiological relevance. Increasingly a broader spectrum of cognitive disorders associated with brain cerebrovascular disease has been recognised. It is now accepted that diffuse white matter disease (as distinct from circumscribed infarction) is a common cause of vascular cognitive impairment [3]. This spectrum includes people who may not be aware of ever having had a "stroke" or brain vascular disease, but who nonetheless have sub-cortical (white matter) disease [4] sufficient to cause clinically relevant cognitive and physical signs. Reflecting this progression in the understanding of brain vascular diseases, DSM now refers to major and mild vascular neurocognitive disorder, and continues to provide specific criteria for an assumed vascular basis of the cognitive impairment [5]. "Vascular cognitive impairment" is the descriptor now in general use encompassing this spectrum of vascular brain disorders [6].

In addition to the DSM criteria, several other clinical criteria and scoring systems have been utilised. Early scoring systems [7] distinguished presumed vascular ischaemic aetiology based on the history of abrupt onset, stroke, or hypertension, the presence of hypertension or focal neurological symptoms or signs, a stepwise deterioration, somatic complaints and emotional lability. Subsequent criteria also included imaging evidence of cerebrovascular disease and additional clinical features such as the early presence of a gait disturbance or falls, incontinence, pseudobulbar palsy, and additional neuropsychiatric signs (personality change,



Fig. 1. Periventricular hypodensity, and atrophy, on CT.

abulia, depression, psycho-motor retardation and impaired executive function) [8,9].

4. Aetiology and convergence of risk factors for the major dementias

Age and the major traditional vascular risk factors (hypertension, smoking, diabetes and hypercholesterolemia) account for the majority of a person's lifetime risk of cardiovascular events [10]. The presence of vascular risk factors such as hypertension and diabetes in midlife is negatively associated with subsequent cognitive function in older age [11,12]. In addition to predicting atherosclerotic disease, these "vascular" risk factors also predict, and appear to promote development of, Alzheimer's disease [13,14]. Data regarding the progression over time of established Alzheimer's dementia are not conclusive, but suggest association of vascular risk factors with progression of cognitive decline in some groups of patients [15]. Other shared risk factors for both vascular and Alzheimer's disease include hyperhomocysteinaemia [16,17], inflammation [14,18], and genetic variants [19]. Depression is a possible further shared risk factor for both vascular and Alzheimer's dementia [20], although residual confounding (for example, by sub-cortical brain vascular disease) cannot be excluded.

Traditional teaching has emphasised the presumed atherosclerotic aetiology of white matter disease. However white matter changes may relate both to arteriolar disease and venulopathy, as well as other processes such as ependymal leakage, oedema due to blood brain barrier disruption and endothelial activation [35]. Venular disease may be particularly important in the typical periventricular white matter changes seen around the anterior and posterior horns (Fig. 1) [35].

5. Epidemiology

Given that dementia and vascular disease are strongly age related, population ageing will be associated with absolute increases in the overall burden of dementia and stroke. Stroke and dementia frequently co-exist; around one in ten patients have dementia prior to their first stroke, increasing to one in five within

Download English Version:

<https://daneshyari.com/en/article/1917211>

Download Persian Version:

<https://daneshyari.com/article/1917211>

[Daneshyari.com](https://daneshyari.com)