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Featured Article

Progress toward standardized diagnosis of vascular cognitive impairment: Guidelines from the Vascular Impairment of Cognition Classification Consensus Study

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Abstract

Introduction: Progress in understanding and management of vascular cognitive impairment (VCI) has been hampered by lack of consensus on diagnosis, reflecting the use of multiple different assessment protocols. A large multinational group of clinicians and researchers participated in a two-phase Vascular Impairment of Cognition Classification Consensus Study (VICCCS) to agree on principles (VICCCS-1) and protocols (VICCCS-2) for diagnosis of VCI. We present VICCCS-2.

Methods: We used VICCCS-1 principles and published diagnostic guidelines as points of reference for an online Delphi survey aimed at achieving consensus on clinical diagnosis of VCI.

Results: Six survey rounds comprising 65–79 participants agreed guidelines for diagnosis of VICCCS-revised mild and major forms of VCI and endorsed the National Institute of Neurological Disorders–Canadian Stroke Network neuropsychological assessment protocols and recommendations for imaging.

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Discussion: The VICCCS-2 suggests standardized use of the National Institute of Neurological Disorders–Canadian Stroke Network recommendations on neuropsychological and imaging assessment for diagnosis of VCI so as to promote research collaboration.

Keywords: Vascular cognitive impairment; Vascular dementia; Guidelines; Criteria; consensus; Delphi

1. Introduction

Since Hachinski et al [1] proposed the term multi-infarct dementia to describe dementia complicating ischemic vascular disease, numerous other descriptors have been used to encompass the heterogeneous clinical and etiological spectrum of cognitive impairment due to cerebrovascular disease (CVD). These include vascular dementia (VaD), vascular cognitive impairment (VCI), subcortical (ischemic) vascular dementia, and vascular cognitive disorders (VCDs), variably diagnosed according to multiple different guidelines or protocols [2–14], some agreed by national institutions or research networks, for example, Alzheimer's Disease Diagnostic and Treatment Centers [11], International Statistical Classification of Diseases, 10th revision [15], the National Institute of Neurological Disorders and Stroke (NINDS)–Association Internationale pour la Recherche et l'Enseignement en Neurosciences [16], and Diagnostic and Statistical Manual of Mental Disorders, fourth and fifth editions (DSM-4 and DSM-5; [17,18]).

Studies comparing some of these protocols have shown they are not readily interchangeable [19–21]. After the commencement of the Vascular Impairment of Cognition Classification Consensus Study phase 1 (VICCCS-1), the American Heart Association/American Stroke Association (AHA/ASA) published a statement on vascular contributions to cognitive impairment and dementia [22]. This supported the use of assessment protocols previously published by NINDS–Canadian Stroke Network (CSN) [13]. There have been other recent contributions to this field from the International Society of Vascular Behavioral and Cognitive Disorders (VASCOG) [23] and the DSM-5 [18]. The level of take up of these recent guidelines is still unclear. Only those published during VICCCS-1, before commencement of VICCCS-2, could be included for consideration in the present study [22,24].

The aim of VICCCS was to achieve broad international consensus on diagnosis of VCI, through participation of a large pool of international researchers and clinicians in an iterative survey using the Delphi approach. After two initial survey rounds, the study was separated into two phases: VICCCS-1, addressing key concepts in our understanding and terminology of cognitive impairment resulting from CVD [25], and VICCCS-2, focusing on the formulation of practical guidelines for diagnosis.

The VICCCS-1 achieved broad consensus on concepts of VCI. It supported the use of "mild" and "major" subdivisions of the severity of impairment, aligning with the revised terminology in the DSM-5. VICCCS-1 participants concluded that attempts to separate mild VCI into further subtypes according to affected cognitive domains were at present premature but agreed that this should be an area of future research. VICCCS-1 agreed (Fig. 1, reproduced from [25]) that the major forms of VCI (VaD) should be classified into four main subtypes: (i) post-stroke dementia (PSD); (ii) subcortical ischemic vascular dementia (SIVaD); (iii) multi-infarct (cortical) dementia (MID); and (iv) mixed dementias (further subdivided according to additional neurodegenerative pathologies). Framed by these concepts, VICCCS-2 used the same Delphi methodology to agree diagnostic guidelines on determination of severity of VCI and discrimination of subtypes.

2. Methods

Participants in VICCCS-1 [25] were invited to participate in VICCCS-2 (Supplementary Figure 1). Although 149 initially agreed to participate, only approximately half were active and committed respondents in three or more rounds, with low attrition and little variation in participation throughout the six rounds (65–79 participants in each round, a mean of 72). Of the active participants, 63%–75% of participants (mean 68%) were clinicians with direct involvement in clinical assessment or health service patient care. The remainder were nonclinical (i.e., supporting clinical work technically or otherwise, but not involved in clinical decision-making, or predominantly involved in research). Individual round representation is provided in Supplementary Table 1.

2.1. Data collection

We used the Delphi method, an iterative, multistaged series of structured questionnaires with feedback of anonymized responses and progressive refinement of questions to reach consensus [26]. The process was co-ordinated by a nonparticipating researcher (O.A.S). Anonymization of responses facilitated free expression of opinion throughout the study. Feedback of summary responses after each round informed subsequent questions and allowed unbiased evolution of group judgment. A threshold of two-thirds agreement was chosen to signify consensus [27] for issues refined iteratively through multiple rounds, as in VICCCS-1 [25]. For issues where this threshold was not reached, we present