Fibromyalgia and vascular dementia: is there a link?

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Fibromyalgia (FM) is characterised by widespread non-inflammatory pain and tenderness persisting for at least three months, and an acute response in at least 11 of 18 specified tender points digitally palpated with a pressure of 4 kg/cm$^2$ [1]. The 1999 ACR classification criteria emphasised tender points and widespread pain as the key features of FM but the 2010 preliminary diagnostic criteria abandoned tender point counts and placed more emphasis on patient symptoms [2]. A later modification of the 2010 criteria for use in surveys adopted the self-report Fibromyalgia Survey Questionnaire (FSQ) as a means of assessing patient symptoms, which may include fatigue, disrupted sleep, impaired cognition, poor physical fitness, headache, arthritis, muscle spasms, tingling, and balance problems. In European populations (Spain, Portugal, France, Germany, and Italy), the estimated overall prevalence of FM is between 2.9% and 4.7% [3], but may vary depending on the diagnostic criteria used [4].

Dementia is defined as a “clinical syndrome due to disease of the brain, usually of a progressive nature, which leads to disturbances of multiple higher cortical functions, including memory, thinking, orientation, comprehension, calculation, learning capacity, language, and judgment” [5]. The most common cause is Alzheimer’s disease (AD), but vascular dementia (VaD), fronto-temporal dementia (FTD), and Lewy body dementia, are also prevalent. In all subtypes of dementia, specific neuropathological changes are responsible for the decline in function [6].

The cognitive dysfunction experienced by patients with FM was largely ignored [7] until the publication of the updated/revised FM diagnostic criteria, even though the FM-associated memory impairment can be severe enough to affect job performance and lead to disability. FM patients report more cognitive difficulties than patients with any other rheumatological disorder [8]: cognitive symptoms are 2.5 times more prevalent, and as many as 76.4-82.5% in a rheumatology practice complained of cognitive difficulties, and more than 50% reported “mental confusion” [9].

Patients with FM often complain of being in a daze or mental fog, sometimes referred to as “fibrofog” [10,11], and may report forgetting conversations, phone numbers, plans, and activities. They may also note feeling lost in familiar places, being unable to carry out simple tasks such as grocery shopping, or finding it almost impossible to carry out complex tasks such as driving. The results of formal cognitive tests are often within normal limits overall, but may also reveal patchy attention deficits. The impaired mental function seems to be mainly due to an impaired ability to focus attention, process and remember new sensory data, and therefore perform complex tasks [11].

The brain networks supporting the cognitive component of pain are not clear [12], although multiple changes in brain structure and function have been reported. Morphologically, grey matter...
atrophy revealed by magnetic resonance imaging (MRI) has provided evidence of CNS involvement, but not of the cause(s) of FM. The grey matter loss thought to reflect abnormally accelerated age-related changes correlates with independently reported clinical cognitive function, and changes in the cingulate, insular and medial frontal cortices and parahippocampal gyri may be functionally related to clinical symptoms [13-15].

Impaired working memory has been associated with the loss of grey matter in the anterior cingulate and medial frontal cortices, and anatomical imaging studies have also suggested that decreased grey matter in the medial prefrontal and insular cortices is related to emotional decision making. Although the precise mechanisms of widespread pain and neurocognitive disorder (NCD) remain obscure, some patients with NCD experience impaired pain perception. To the best of our knowledge, only two papers have described FM as a complication of NCD [16,17]. Nishioka described seven patients with a clinical diagnosis of frontotemporal NCD (n = 3) or Alzheimer’s disease (n = 4), none of whom had any organic disorder that could explain their chronic and continuous widespread pain, which was is refractory to analgesics. Brain MRI revealed moderate or severe atrophic changes in the temporal lobes and hippocampus, and three-dimensional stereotactic surface projection (3D-SSP) analysis of brain single photon emission computed tomography (SPECT) indicated severe hypoperfusion on the right side of the medial temporal lobe, both sides of the anterior corpus callosum, as well as in the anterior cingulate gyrus and primary sensory area. Genetic analysis did not reveal any pathogenic mutations. The authors concluded that central sensitisation may be a possible risk factor for widespread pain in elderly patients with NCD.

The percentage of elderly healthy people progressing to FM remains unknown. SPECT data support the hypothesis that specific regions causing neurodegeneration induce centralised sensitisation, and aging or mild cognitive impairment may also be a risk factor for FM. Further studies are required to investigate the frequency of FM or chronic widespread pain in the elderly, and their correlations with vascular dementia (18).

References


