Changes in clinical manifestation of fibromyalgia syndromes after Alzheimer’s disease diagnosis

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ABSTRACT
Fibromyalgia syndrome (FMS) is defined by chronic widespread pain persisting for more than 3 months without an apparent physical cause. The prevalence of FMS peaks between 50 and 70 years old, and it can be difficult to diagnose and treat due to other comorbid conditions. Recent work has suggested that neurodegenerative conditions can be complicated by chronic pain. This case study presents four patients with FMS residing in nursing homes. In all four cases, with the progression of Alzheimer’s disease, patients saw improvements in pain syndromes, albeit to different degrees, and marked improvements in mobility. All four patients also developed challenging behavioral and psychological symptoms of dementia requiring psychotropic prescriptions.

KEYWORDS Alzheimer’s dementia; chronic pain; fibromyalgia; nursing home

Fibromyalgia syndrome (FMS), a condition of central sensitization, is defined by chronic widespread pain, stiffness of muscles and joints, and fatigue persisting for >3 months without an apparent physical cause. Some individuals with FMS may have other unexplained physical health symptoms, and there is evidence of substantial psychiatric comorbidity. The prevalence of FMS peaks between 50 and 70 years old, and the presentation of FMS can be influenced by a wide variety of physical and psychosocial factors. Recent work has suggested that neurodegenerative conditions can be complicated by chronic pain. This case series presents four patients with FMS residing in a 44-bed nursing home and describes how the diagnosis and progression of Alzheimer’s disease (AD) affected the manifestation of their FMS.

CASE DESCRIPTIONS
Four patients, three women and one man, with confirmed diagnoses of FMS predating a dementia diagnosis were admitted to a nursing home where clinical care is provided by a general practice team. All patients were admitted after family members were unable to care for them at home due to AD progression. Patients were diagnosed by a geriatric psychiatrist using the International Classification of Disease–10 criteria. Diagnosis involved clinical assessment and physical examination, in an outpatient clinical setting or at home, alongside laboratory workup, computed tomography, and formal cognitive testing.

Admissions occurred from January 2019 onwards. Patient records were retrospectively reviewed for 12 months from admission to the nursing home, and baseline characteristics (age, gender, age at FMS and AD diagnoses, comorbid diagnoses, and psychotropic medication prescriptions) were recorded. All patients or their caregivers were informed of the purpose of this retrospective analysis of case records and consented to the information being used and published.

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The author reports no conflicts of interest. Written informed consent was obtained from the patients/family members for publication of this case series.

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For each patient, pain was assessed using the Pain Assessment in Advanced Dementia, the widespread pain index validated for FMS, and cognition was quantified using the Six-Item Cognitive Impairment Test, with nursing home care staff recording mobility assessments on a quarterly basis in line with nursing home policy.

Table 2 summarizes changes in these domains over time.

Alongside documented deterioration in cognition and improvement in pain score and mobility, all four patients developed challenging behavioral and psychological symptoms of dementia (BPSD). Case 1 developed a moderate to severe depressive illness within 6 months of admission, with marked anxiety disorder with insomnia. More broadly, there were family concerns regarding apathy and social withdrawal. These symptoms were managed with the introduction of antidepressants, as well as anxiolytics with the support of the local psychogeriatric community team. Regular input from the community psychiatric nursing team was required to engage with symptoms of severe anxiety disorder and panic attacks. The family reported no premorbid psychiatric diagnoses.

Over the initial period of admission, Case 2’s depressive disorder and insomnia deteriorated, which responded well to an increase in her citalopram and change from melatonin to trazodone. Nursing home staff voiced concerns about paranoia of her food and tablets being poisoned in the absence of delirium, but these responded with nondrug measures. Case 3 developed moderate to severe depressive disorder after admission that responded well to alterations in her antidepressant medications. However, she developed delusions regarding some staff at the nursing home leading to challenging and aggressive behavior; although this was generally managed well with nondrug measures, lorazepam was required at times. Case 4 also required upward titration of her antidepressant and addition of another agent to manage physical symptoms associated with her depressive disorder.

For all patients, psychotropic prescribing was supported by the primary care geriatric psychiatry liaison team, who provided advice regarding medications to utilize for different patients based upon their presentation and potential for iatrogenic harm.

**DISCUSSION**

This small case series has isolated two findings of interest. First, in all four cases, with the progression of AD, patients saw improvements in pain syndromes, albeit to different degrees, and marked improvements in mobility. It has been reported that patients with AD and chronic pain are likely to feel diminishing levels of pain as a result of cognitive decline. Generally, pain threshold tolerance is increased with advancing AD, but the nature of this relationship can be challenging to discern. A single case study reported that a 71-year-old woman with FMS and AD noted improvements in FMS symptoms and mobility with cognitive decline. A Japanese case series of seven older patients with FMS and neurocognitive dysfunction, which included single-photon emission computed tomography imaging, found that central sensitization may be a risk factor for widespread pain syndromes in older patients with cognitive dysfunction. The relationship between

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**Table 1. Pertinent clinical characteristics of four patients**

|                     | Case 1 | Case 2 | Case 3 | Case 4 |
|---------------------|--------|--------|--------|--------|
| Age (years) at admission to nursing home | 85     | 79     | 74     | 90     |
| Gender              | Male   | Female | Female | Female |
| Age of FMS onset     | 67     | 70     | 65     | 75     |
| Age of AD onset      | 82     | 75     | 72     | 85     |
| Comorbidities        | COPD, diverticulitis, migraine, osteoarthritis, BPH, hypertension, pacemaker—third-degree heart block, T2DM | Osteoarthritis, IHD, hypertension, breast cancer (remission), CKD stage 3b, depression | Hypertension, osteoporosis, IHD, osteoarthritis, venous eczema, insomnia, T2DM | Psoriasis, hypertension, ARMD, osteoporosis, CKD stage 4, insomnia, generalized anxiety disorder |
| Psychotropic medications on admission | None   | Citalopram 10 mg OD; melatonin 4 mg Nocte | Zopiclone 15 mg Nocte | Citalopram 10 mg OD; nitrazepam 2.5 mg Nocte |
| Psychotropic medications at 12 months | Sertraline 100 mg OD; zopiclone 3.75 mg Nocte; lorazepam 500 mcg BD; amitriptyline 10 mg Nocte | Trazodone 50 mg Nocte; citalopram 30 mg OD | Citalopram 20 mg OD; zopiclone 15 mg Nocte; mirtazapine 30 mg Nocte; lorazepam 500 mcg PRN up to once daily for distress | Citalopram 30 mg OD; mirtazapine 45 mg Nocte; zopiclone 7.5 mg Nocte |

AD indicates Alzheimer’s dementia; ARMD, age-related macular degeneration; BD, twice daily; BPH, benign prostatic hyperplasia; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease; FMS, fibromyalgia syndrome; IHD, ischemic heart disease; Nocte, at night; OD, once daily; PRN, as needed; T2DM, type 2 diabetes.
the disease process of AD and its impact upon FMS requires further review, in particular whether alterations in pain and mobility are typical in this patient group and the prevalence of FMS among older patients with cognitive dysfunction.

Second, all four patients developed challenging BPSD requiring psychotropic prescriptions. A systematic review indicated that 82% of residents of nursing homes exhibited apathy being most prevalent. General rates of psychiatric diagnoses within the nursing home where all patients resided were 14%, 6.8%, and 9% for pure depression, pure anxiety, and mixed depression and anxiety disorder. This is in keeping with internationally reported levels. However, the widespread pain index has not been validated in a dementia population. In relation to the main findings of reductions in pain and improvements in mobility, it could be suggested that patients experienced less pain within the nursing home environment than they did prior to admission. However, this did not appear to be the case due to the level of engagement within the nursing home and based on review of admission reports.

There are inherent limitations in extrapolating from small case series without age-matched controls. More specifically, the widespread pain index has not been validated in a dementia population. In relation to the main findings of reductions in pain and improvements in mobility, it could be suggested that patients experienced less pain within the nursing home environment than they did prior to admission. However, this did not appear to be the case due to the level of engagement within the nursing home and based on review of admission reports.

This small case series has isolated that progressive dementia syndromes may lead to improvements in pain experiences with FMS, postulated to be related to damage to cerebral structures and neuronal processing, alongside the potential that FMS patients with dementia may experience troublesome BPMS. Within the locality, there are efforts to perform prospective clinical research in this area to further interrogate the nature of the relationship between FMS, BPMS, and AD and to investigate the frequency of FMS in the elderly population. More broadly, the relationship between patients with FMS with preexisting psychiatric diagnoses and their risk of developing dementia syndromes is being actively researched.

Table 2. Changes in pain, cognitive, and mobility domains over time

| Domain                        | Case 1 | Case 2 | Case 3 | Case 4 |
|-------------------------------|--------|--------|--------|--------|
| Pain assessment in advanced dementia |
| Month 0                      | 9      | 10     | 10     | 8      |
| Month 4                      | 9      | 8      | 7      | 6      |
| Month 8                      | 8      | 7      | 7      | 5      |
| Month 12                     | 6      | 7      | 5      | 4      |
| Six-item Cognitive Impairment Test |
| Month 0                      | 21     | 22     | 24     | 21     |
| Month 4                      | 25     | 23     | 24     | 24     |
| Month 8                      | 28     | 28     | 28     | 24     |
| Month 12                     | 28     | 28     | 28     | 26     |
| Widespread pain index         |
| Month 0                      | 19     | 17     | 16     | 19     |
| Month 4                      | 19     | 16     | 15     | 18     |
| Month 8                      | 16     | 14     | 12     | 16     |
| Month 12                     | 12     | 14     | 10     | 14     |
| Mobility                      |
| Month 0                      | 2 staff (WC) | 1 staff (ZF) | 2 staff (WC) | 2 staff (WC) |
| Month 4                      | 1 staff (ZF) | 1 staff (ZF) | 1 staff (ZF) | 2 staff (WC) |
| Month 8                      | 1 staff (ZF) | Walking unaided | 1 staff (ZF) | 2 staff (WC) |
| Month 12                     | 1 staff (ZF) | Walking unaided | 1 staff (ZF) | 1 staff (ZF) |
| Pain                          | Improved | Improved | Improved | Improved |
| Dementia                      | Progression | Progression | Progression | Progression |

WC indicates wheelchair; ZF, Zimmer frame.

negative impacting the severity and course of FMS, but the nature of the relationship between FMS and BPMS, an almost universal phenomenon in dementia, has not been explored to date.

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Avocations

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