Title:

Fracture risk is under-recognised and under-treated in memory clinic attendees

Running title:

Fracture risk in the memory clinic

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Keywords

Memory clinic; osteoporosis; fracture risk; dementia

Abstract

UK national guidelines recommend that older people at risk of falling should have their fracture risk assessed and acted upon. People with cognitive impairment are more likely to sustain a fracture than their cognitively intact peers. We assessed the fracture risk of 79 memory clinic attendees and compared their actual management with guidelines. Despite reporting 57 falls in the last year, only 36% of those who would be recommended antiresportive treatment were prescribed it and a DEXA scan was performed in only 13% where it would be recommended. These findings highlight an important deficit in fracture risk assessment which should inform future interventions.

1. Introduction

There are an estimated 850,000 people in the United Kingdom (UK) living with dementia. This figure is expected to exceed one million by 2025 and two million by 2051[1]. People with cognitive impairment have at least a two-fold risk of falling compared to their cognitively intact peers [2,3]. In addition, having fallen, they are at higher risk of sustaining a fracture, particularly a hip fracture [4] and have a poorer recovery following a fracture than the general population[5]. Evidenced-based interventions that reduce the risk of fracture are therefore to be welcomed.

NICE recommends that fracture risk assessment be considered in all women aged over 65, all men aged over 75 and younger people (>50yrs) in the presence of risk factors[6]. The presence of cognitive impairment is a risk factor for falling and fracturing[7]. Therefore, a suspected or diagnosed cognitive impairment should ideally prompt a fracture risk assessment, which should then be acted upon.

FRAX® is a fracture risk assessment tool used to evaluate a patient's probability of fracture in the next 10 years based on individual patient models of clinical risk factors and femoral neck bone mineral density (BMD)[8]. A patient's FRAX® scores can be used to identify one of three recommended managements based on National Osteoporosis Guideline Group (NOGG) advice: lifestyle advice and reassurance for those at low risk; measurement of BMD using DEXA and recalculation of FRAX® for those at medium risk; and treatment for those at high risk[9].

This project set out to assess whether memory clinic attendees had had their fracture risk identified and acted upon in accordance with NOGG guidelines.

2. Materials and methods

The Research Institute for the Care of Older People (RICE) provides the National Health Service (NHS) memory clinic for the population of Bath and North East Somerset in the UK, a mix of rural and urban areas. People attending the RICE Memory Clinic to see a physician from the 1st of February until the 12th of March 2018 (6 weeks) were included in this study. The 10-year-risks of major osteoporotic fractures and hip fractures were calculated using FRAX® by their physician (TW (geriatrician), CW (GP/memory clinic physician) or JH (old-age psychiatrist)) as part of routine care. TW is a geriatrician experienced in bone health management and provided an update and training in the use of fracture risk assessment

tools. NOGG recommendations based on this assessment were documented. Attendees' current bone treatment plan, falls history and any historic DEXA scans were documented. These collected data, together with demographic information, cognitive diagnoses and Mini-Mental-State Examination[10] scores were combined and anonymised. Recommended fracture risk treatment and actual treatment were then compared.

3. Results

Data were available from 79 attendees. Table 1 summarizes the results.

Table 1 Fracture risk, cognitive diagnoses, recommended and enacted treatments

Demographics	All	Male	Female
N	79	32	47
Mean Age (SD)	83 (5.9)	81 (5.5)	84 (6.0)
Mean MMSE (SD)	21 (4.8)	21 (4.9)	21 (4.7)
Cognitive diagnosis			
Alzheimer's Disease dementia	23 (29%)	7 (22%)	16 (34%)
Vascular dementia	10 (13%)	3 (9%)	7 (15%)
Mixed dementia	13 (16%)	8 (25%)	5 (11%)
Fronto-temporal degeneration	4 (5%)	2 (6%)	2 (4%)
Dementia with Lewy bodies	1 (1%)	1 (3%)	0 (-)
Mild Cognitive Impairment	13 (16%)	6 (19%)	7 (15%)
Other	3 (4%)	1 (3%)	2 (4%)
Unspecified dementia	12 (15%)	4 (13%)	8 (17%)
Mean 10-year risk % (SD)			
Major osteoporotic fracture	21% (12)	11% (7)	28% (10)
Hip fracture	12% (9)	6% (4)	15% (10)
Comparison of recommended and actual management			
Lifestyle advice	17 (22%)	17 (63%)	0 (0%)
DEXA recommended	30 (38%)	9 (28%)	21 (45%)
DEXA carried out	4 (5%)	2 (6%)	2 (3%)
DEXA proportion of recommended	13%	22%	10%
Treatment recommended	28 (35%)	2 (6%)	26 (55%)
Treatment prescribed	10 (13%)	1 (3%)	9 (19%)
Treatment proportion of recommended	36%	50%	35%
Treatments prescribed			
Calcium/vitamin D	26 (33%)	3 (9%)	23 (49%)
Oral bisphosphonate	8 (10%)	1 (3%)	7 (15%)
IV bisphosphonate	1 (1%)	-	1 (2%)
Denosumab	1 (1%)	-	1 (2%)

4. Discussion

The fracture risk management of this population of memory clinic attendees did not follow the NOGG recommendations. Of the 28 attendees where guidelines recommend treatment be started, only ten (36%) were on recommended therapy. Only two out of 21 (10%) female attendees had undergone the recommended DEXA scan. Fifty-eight (73%) patients were recommended either to start treatment or undergo a DEXA scan based on their FRAX® scores, but only 14 of those had had this recommendation acted upon.

The participants in this project were typical of the population who attend memory clinics in England, who are typically White British, less deprived, and have an MMSE of <24 [11]. This is also in keeping with the population of Bath and North East Somerset [12]. As such these findings are likely to be generalizable to other memory clinic populations. However, there were some limitations to the project which potentially affect the interpretation of the findings. The sample size was small and was carried out in only a single memory clinic over a time limited period. Data collection for the calculation of the FRAX® score relied on participants' recall of a number of risk factors such as alcohol consumption and parental hip fracture. Where there was uncertainty it was assumed that a participant had not been exposed to the risk. This assumption tends to an under-estimate of the fracture risk. Missing data from two individuals, albeit a small proportion of the study population, led to them being excluded from the analysis. The medical staff working in this clinic were not typical of many UK memory clinics which are largely run by psychiatrists who may not have experience in fracture risk assessment. This potentially limits the management of fracture risk within a psychiatry led memory clinic. Assessment processes, however, could still highlight those most at risk and in need of appropriate treatment.

We are unaware of any previous published data on fracture risk management in memory clinic populations in the UK. We are aware of one study that was carried out in Australia, where only 9.9% of memory clinic attendees who required treatment were on specific antiresorptive therapy [13]. In the UK, of those presenting with a hip fracture in one series, only 33% of those who required treatment were receiving it [14]; a similar level to that in this project. In a Portuguese study, despite national guidelines identifying 91.5% as requiring treatment, only 21.5% were actually on appropriate medication[15]. The reasons for this treatment gap are complex, multifactorial and in many cases unclear. To a degree it may relate to uncertainty over clinical responsibility for fracture risk and osteoporosis assessment which is often shared between primary and secondary care [14]. Despite increasing publicity and updated guidance there has been a drop in prescription rates for anti-osteoporotic drugs in recent years, particularly amongst women [16]. Unless this represents informed patient choice, or therapeutic breaks in treatment, it is concerning. Fear of the rarer side effects of bisphosphonates, such as the much publicised risk of atypical femoral fractures, by both patient and physician, may be a contributing factor in this under-treatment [17]. Even when treatment is recommended, the majority of those prescribed weekly oral bisphosphonates stop taking them within one year [18]. This constitutes a major challenge and needs to be understood in order to provide effective and acceptable strategies to improve assessment and, where appropriate, uptake of treatment. Of course, shared decision-making involves the integration of evidence and values, which may be more difficult as cognitive impairment advances, but should still be pursued [14,19].

Nevertheless, there is good quality research evidence to support the use of medication in osteoporosis for fracture prevention[20] and this underpins current guidelines on fracture risk reduction [9],[15]. People with cognitive impairment are more likely to fall and sustain a fracture than their cognitively intact peers and they are more likely to have poorer outcomes following a fracture[5]. As such FRAX® may be under-estimating their risk of fracture. Different thresholds for initiating medication to reduce fracture risk may apply to this group. However, the evidence from this project highlights that at present treatment levels do not even approach current recommendations. Before dementia-specific recommendations can be made, better implementation of current guidance is required. Given the increased risk of

fracture in people with cognitive impairment, referral to a memory service provides the opportunity to highlight this risk and intervene. We intend to use these findings to support further exploratory work to identify barriers to risk assessment and treatment implementation. Ultimately, we intend that these findings will support future work to test interventions that may improve treatment rates.

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Conflict of interest statement for all authors

The authors declare no conflict of interest

Ethical approval

This project was deemed service evaluation and not to be categorised as research as per Health Research Authority (HRA) guidance and as such ethical approval was not sought.

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