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Closing the Osteoporotic-Fracture Care Gap for Frail Older Persons

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Abstract

Aim

To implement standardised fracture risk assessment in the frail older person.

Methods

Frail older patients underwent opportunistic screening for fracture risk. Roadblocks to standardised assessment were identified. An Integrated Care Team for older persons (ICT) trained in fracture risk assessment using FRAX. Clinical assessment was via a locally agreed algorithm. Data was entered onto Excel. The SQUIRE guidelines for quality improvement programmes were used to report the results.

Results

Of 96 patients opportunistically screened, the average age was 84 years. FRAX was completed for 19% (n=18). 89% (n=16) met the pharmacotherapy threshold. Nine were recommended pharmacotherapy. Of sixteen patients recommended for DXA, just 31% (n=5) were booked. Following implementation of a quality improvement project, 100 patients were assessed, and average age was 80 years. FRAX was completed for 62% (n=63) and 95% (n=60) required pharmacotherapy. 24% (n=14) had untreated prior fracture. All had pharmacotherapy prescribed. 59% (n=59) required DXA scanning. 70% (n=41) had DXA ordered.

Conclusion

ICT ownership increased FRAX assessment 3-fold and point of contact prescribing to 100%.

Introduction

Ireland has the 6th highest hip fracture rate in the world. [1] The establishment of a national fracture prevention strategy aimed at reducing the total number of hip fractures is important. Fracture admissions to Irish public hospitals have been shown to have increased by 30% between 2010 and 2014. [2] Fracture liaison services (FLS) increase fracture prevention rates in high risk patients. A comprehensive FLS can reduce the total number of future incident fractures. Significant numbers of patients with a first fragility fracture do not undergo fracture risk assessment and management. An Irish study has shown that up to 64.5% of medical inpatients over the age of 65 years exceed the National Osteoporosis Federation threshold for fracture prevention treatment.[3] This can be seen worldwide where in the Canadian population fewer than 20% of patients receive pharmacotherapy to prevent future fragility fractures in contrast with 75% of patients who receive β-blockers beta blockers to prevent a subsequent myocardial infarction.[4]

No quality indicators are yet in place in the Irish healthcare system for FLS. There is a plan to establish a National service strategy with targets for the 16 trauma hospitals currently submitting data to the Irish National Hip Fracture Database.[5] Non-regional centres have yet to be included in national strategies. Non-regional centres comprise over half of the hospitals in Ireland. Integrated care teams provide a potential solution to providing FLS in non-regional centres.

This Quality Improvement Project (QIP) is in a Model 3 non-regional centre, serving a population catchment area of 110,000 and has been reported using the SQUIRE guidelines.[6] An FLS is operational for 10 years providing targeted assessments for persons over the age of 50 years attending an orthopaedic fracture clinic.[7] The cost benefit of fracture prevention has been shown in community based studies. A systematic, community-based screening programme of fracture risk in older women in the UK showed that the incremental cost of screening per Quality Adjusted Life Year gained was £2,772. The intervention arm prevented fractures at a cost of £4,478 and £7,694 per fracture for osteoporosis-related and hip fractures respectively.[8]

Cost-effectiveness of treatments applied on a population basis is a key part of effective healthcare planning. Drugs used to treat osteoporosis have been found to be cost-effective in postmenopausal women over the age of 60, particularly if they had other risk factors.[9] This further strengthens the case for a catchment wide approach to case finding of patients at high risk of fracture.

The integrated care team (ICT) for older persons provides care to the frail older person across both catchment-based acute and community settings. It became apparent to the ICT for older persons that the rate of fracture risk assessment in the frail older inpatient and those attending outpatients was unknown. The FLS linked with the ICT for older persons in 2019. The QIP was developed to provide quality FLS to those at highest risk of primary and secondary fracture, prescribe appropriate pharmacotherapy and ensure that Dual energy Xray Absorptiometry (DXA) where deemed appropriate, is requested and followed up.

Methods

Initially, patients routinely referred to the Senior Pharmacist, as part of Comprehensive Geriatric assessment (CGA),[10] completed the Fracture Risk Assessment Tool (FRAX)[11] if identified at high risk for fracture. Patients were identified as high risk if they had a previous fracture, rheumatoid arthritis, premature menopause, chronic obstructive pulmonary disease or were prescribed long term steroids or proton pump inhibitors but not already on osteoporosis treatment. FRAX was also completed on patients as part of a pharmacy falls review if requested. Pharmacy assessments were paper based. Recommendations were made in the patient's medical notes and verbally communicated to the in-patient medical team and/or to the ICT for older persons. During this case-finding phase it was self-evident that the cohort of patients being reviewed were at high risk of fracture, that there were larger numbers than could be assessed, that competing interests meant that a standardised approach to all patients could not be achieved and that there was a cohort that could not be monitored as they were physically unable to have a DXA scan performed. Data collection was not standardised. Follow up and outcomes were not routinely measured. The numbers of patients assessed for fracture risk, FRAX, proportion of DXA scans booked and prescribing of bone health medication were retrospectively recorded onto an Excel spreadsheet from paper records and analysed. This led to a quality improvement project which follows the SQUIRE guidelines for a QIP.

The QIP involved extending the service to the ICT for older persons. Patients aged 70 and above, attending selected medical out-patient clinics or admitted through the Emergency Department, are routinely triaged to the ICT for older persons with the VIP tool. The VIP (Variable Indicative of Placement risk) is a validated screening instrument which identifies hospitalised patients aged 70 years and older who are most likely to benefit from specialist geriatric assessment.[12]

FRAX became part of the CGA carried out by the ICT for older persons. Following CGA, each patient was discussed at a Consultant-led multi-disciplinary meeting (MDM). Secondary osteoporosis screening blood tests and DXA scans were booked and pharmacotherapy prescribed. During this phase, FRAX scores were documented in a standardised fashion onto a paper template. The MDM allowed for standardised supervised assessment of fracture risk, DXA booking and bone health medication prescribing. A prescribing algorithm was developed in order to allow different practitioners to prescribe uniformly. The cut-offs for prescribing are greater than 20%, 10-year probability of major osteoporotic fracture or greater than 3.5% 10-year probability of hip fracture. Data routinely collected included age, gender, previous history of fragility fracture, FRAX score, DXA scan booking and prescription of pharmacotherapy. Patients' functional ability as measured by Barthel index[13], mobility status, visual impairment, falls history and clinical frailty score were also recorded. Clinical frailty score (CFS) was used, as a part of CGA, to assess the level of frailty of patients. The CFS is a validated scale, providing a summary tool for clinicians to assess frailty and fitness. [14] Patients were divided into mild, moderate and severely frail.

Data was entered onto an Excel spreadsheet by a trained administrator. Descriptive statistics were used to analyse the data.

Consent was not required as the assessment and intervention provided is part of routine clinical practice.[15,16] There were no ethical issues foreseen, identified or raised for this QI project.

Results

Data for 96 patients was collected during the initial case finding stage. The average age was 84 years with a 1:1 male to female ratio. FRAX was available for 19% (n=18), of those 89% (n=16) met the pharmacotherapy threshold. 37.5% (n=6) had a clinically significant FRAX but no prior history of fracture. 19% (n=3) had a history of previously untreated fragility fractures. For 44% (n=7) history of previous fractures was not documented. DXA was booked for 31% (n=5) out of the 16 patients where DXA was recommended. For 56% (n=9) out of 16 patients, recommendations regarding starting pharmacotherapy were made but there was no record of whether prescriptions were issued.

During the QI phase data for 100 consecutive patients, referred to ICT for older persons through both inpatient and outpatient pathways, was collected prospectively. The average age was 80 years with a 1:1.5 male to female ratio. In addition to FRAX the CGA furnished the team with data relevant to the older person and fracture risk. With regard to the Barthel index, most patients 42% (n=42) had low functional dependence, followed by 22% (n=22) with medium dependence, 8% (n=8) with high dependence while 1% (n=1) maximally dependent for activities of daily living (ADLs). With regard to mobility, 25% (n=25) of patients were functionally independent. 38% (n=38) were able to mobilise unaided. 24% (n=24) used a rollator Zimmer frame, 37% (n=37) used a walking stick, while only 1% (n=1) was a wheelchair bound patient. A large number of patients 61% (n=61) reported a history of at least one or multiple falls while 39% (n=39) had no previous history of falls. Visual impairment was noted in a majority of patients 55% (n=55). 34% (n=34) were found to be moderately frail, 28% (n=28) were mildly frail. 14% (n=14) of the patients included in the cohort were severely frail.

FRAX was available for 62% (n=62) patients, of those with 95% (n=59) meeting the pharmacotherapy threshold. FRAX was not calculated for 38% (n=38) patients. 24% (n=14) patients had a previous history of untreated osteoporotic fracture. 70% (n=41) had DXA scans booked where deemed appropriate. All patients qualifying for pharmacotherapy had it prescribed at the point of first contact.

Discussion

A case finding strategy identified that many patients at risk of fracture were not receiving appropriate pharmacotherapy and DXA scan. Training of an ICT for older persons increased the number of patients screened for fracture, who received pharmacotherapy review and point of contact prescribing. The QI project enabled patient cohort profiling. The majority of patients while being determined as moderately frail, have low dependency and a history of at least one fall. This is a high-risk fracture group.

Not all patients were FRAX scored. The reason for this is likely to be multifactorial – already on bone health medications, unable to get both height and weight at the time of assessment and competing clinical interests. Future data collection will need to take note of the reasons for FRAX not being completed so that we can understand the barriers to standardised care.

A team already engaged in integrated care for the older person extended their training to include FRAX scoring, which was a whole-time equivalent cost-neutral initiative. Greater numbers of patients at high fracture risk receive appropriate fracture prevention as a result of this QIP.

Controversy around the accuracy of fracture prediction using FRAX based cut-offs exist. Despite no particular supporting evidence, numerous guidelines have developed which use a FRAX score cut off to determine whether pharmacotherapy should be commenced. [17] The use of clinical risk factors in conjunction with BMD and age improves sensitivity of fracture prediction without adverse effects on specificity. Even if the performance of FRAX is enhanced by the use of BMD tests, it should be recognised that FRAX without BMD has a predictive value for fractures that is comparable to the use of BMD alone. FRAX remains a well validated tool to evaluate fracture risk. In patients where treatment will be commenced and DXA is possible, treatment follow-up requires that bone density measurement is used in addition to FRAX in order to monitor response to drug therapy.

There are some limitations to this work. The availability of a Geriatrician and pharmacist with an interest in osteoporosis were key. Therefore, it is not generalisable to every healthcare setting. The retrospective nature of data collection in the first study phase is likely to have resulted in less accuracy in data recording.

This QI project helped to pinpoint gaps in the identification of fracture risk and enabled an ICT for older persons to implement a pathway for identification and management. Ad-hoc opportunistic screening informed the development of a standardised fracture risk assessment process and point of contact prescribing. This was achieved through an integrated care team for the older person.

Declaration of Conflicts of Interest:
No conflict of interests to be declared.

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