Investigation and treatment after an osteoporotic fracture:
A survey of the Fracture Liaison Service in Örebro County

Version 2

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Abstract

**Introduction:** An osteoporotic fracture affects every other woman and every fourth man in Sweden. To meet the needs, Örebro County implemented in 2007 a fracture liaison service (FLS) to identify, investigate and treat these patients.

**Aim:** To evaluate the efficacy of the FLS in Örebro County by reporting the prevalence of bone mineral density testing and anti-osteoporotic treatment initiation following a low trauma fracture. Secondary aim was to evaluate adherence to treatment after 12 months.

**Methods:** 1269 medical records were retrospectively examined for all patients, 50-85 years old, with a fractured wrist, upper arm, hip, pelvis or vertebra in Örebro County in 2016. Patient characteristics and continuation through the FLS was studied. Primary objectives were all descriptive, but various subgroups were compared using chi-square and independent t-tests. Limit of significance at p<0.05.

**Results:** 738 patients were eligible for inclusion (mean age 71.00 (±9.16) years, 76.6% women). 391 (53.0%) were referred for investigation, of which 348 (89.0%) attended. 253 (72.7%) of the measured patients had indication for treatment, later prescribed to 76.7% of these, mainly once weekly oral bisphosphonates (64.4%). Adherence after 12 months was available for 176 patients, of which 119 (67.6%) were still persistent.

**Conclusion:** The FLS in Örebro County seems to be in line with national and international counterparts. Still, there is room for improvement. The major gap appears to be identification and referral for investigation of patients at risk of osteoporosis. Once passed the identification step, the losses through the program are in much smaller proportions.

**Key words:** Fracture; Fracture Liaison Service; Osteoporosis; Management; Treatment.
Abbreviations

BMD: Bone mineral density
DXA: Dual energy X-ray absorptiometry
SD: Standard deviation
RRR: Relative risk reduction
FLS: Fracture liaison service
OC: Orthopedic clinic
MD: Medical department
GP: General practitioner
OR: Odds ratio
CI: Confidence interval
iv: intravenous
sc: subcutaneous
Introduction

Osteoporosis is defined as a bone mineral density (BMD) more than 2,5 standard deviations (SD) below that of young and healthy women according to the World Health Organization[1]. This criteria is based on measurements with dual energy X-ray absorptiometry (DXA)[2].

Osteoporosis increases the risk of fragility fractures, i.e. fractures caused by low energy trauma that would not be sufficient to cause a fracture in a normal bone, and include those of the hip, pelvis, spine, proximal humerus and distal radial bone[1]. 50% of all women and 25% of all men in Sweden suffer an osteoporotic fracture during their lifetime[3]. Its prevalence increases with age, and therefore the total prevalence due to increased longevity[4]. The national cost has been estimated to over 0,5 billion Euro annually[5].

Apart from the economic cost, osteoporotic fractures are associated with increased morbidity [6] and an increase in one-year mortality with 10-15% compared to age and gender matched controls[3]. In addition, a prior fracture increases the risk of future fractures. In general the risk is doubled, but after a vertebral fracture the risk increases fourfold for new vertebral fractures[7]. Since about half of the women presenting with a hip fracture have had a previous fragility fracture[8], and 45% of all hip fractures are sustained by only 16% of that patient group[9], an early identification and proper handling of these patients could be highly cost-effective.

There is substantial evidence that medical treatment to patients with osteoporosis reduces the re-fracture rate[10–13]. Oral bisphosphonates once weekly are currently the most commonly used anti-osteoporotic drug[14] and randomized clinical trials have shown a relative risk reduction (RRR) of 39% for non-vertebral fractures and 41-49% for vertebral fractures after three years of treatment[15,16]. The second most commonly used treatment is once yearly intravenous (iv) zoledronic acid, with a RRR of 41% for vertebral fractures and 70 % for hip fractures[17]. Despite well-documented evidence, only a minority of all fragile fracture patients receive treatment. The National Board of Health and Welfare in Sweden (Socialstyrelsen) has reported that treatment is initiated in only 14% of all low trauma fracture patients, while their guidelines say 60-70%[3]. At the same time, adherence to oral bisphosphonates has been reported low with only about 30% still persisting after one year[18].
In an effort to better meet the needs of assessment and treatment, Fracture Liaison Services (FLS) has been implemented to identify, investigate and, when necessary, treat fragility fracture patients. Earlier studies have shown significantly higher rates of investigation and treatment in centres running an FLS compared to standard or primary care [19–24]. An Italian study evaluating the differences in the same centre before and after implementation of an FLS reported an increase in BMD-testing from 14.5% to 47.6% (p<0.01) [22]. The main aim of any FLS is to reduce the risk of subsequent fractures. Studies comparing the re-fracture rate in FLS-patients to those assessed in standard or primary care, has shown FLS-programs to reduce the risk significantly within 2-4 years for new fractures to occur [23,25–28].

An FLS can be structured in different ways depending on local conditions. Either the complete program is delivered within the FLS, or it can involve the primary care for investigation and/or treatment initiation. The common theme is however a structured way of identifying patients with fragility fractures, and a standard way of referring them further on in the program [29].

Aim

The aim of our study was to evaluate the efficacy of the FLS in Örebro County by reporting the prevalence of BMD-testing and treatment initiation with anti-osteoporotic medication following a low-trauma fracture, according to regional guidelines. Secondary aim was to evaluate adherence to treatment after 12 months.

Material and Methods

Study sample and design

Medical records for all patients (n=1269), 50-85 years old, presenting from January 1st until December 31st of 2016 to one of the three orthopedic facilities making up the orthopedic clinic (OC) in Örebro County with a fractured wrist, upper arm, hip, pelvis or vertebra were studied retrospectively. A list of all these patients was collected from the digital records and designed to include all patients diagnosed with any of the ICD-diagnostic codes matching these fractures (S52.50/51, S52.60/61, S42.20/21, S72.0, S72.10/11, S72.20/21, S32.1/3/5/8, S22.0/M80.0J, S32.0/M80.0K or M48.5). Our study population, equated to all patients eligible for the FLS, was subsequently obtained from this list by examining the records for each patient of a documented decision regarding inclusion or exclusion in the service, and for
all patients lacking a decision, the presence of inclusion- and exclusion criteria for the FLS. Inclusion criteria were defined as an age 50-85 years and having a low trauma fracture (caused by a fall from standing height or less) localized to any of the previously mentioned sites. Exclusion criteria were defined as having a pathological or high trauma fracture, being under investigation for osteoporosis, already being optimally treated for the condition, considered unable to manage the process of investigation and/or treatment and belonging to a different Swedish county. Our study population subsequently consisted of all patients having a documented decision to be included in the FLS and all patients lacking a decision but meeting the FLS-inclusion criteria. Audited factors for this group were age at the time of the fracture event, gender acquired from the personal identity number and fractured site (if more than one we used the main diagnosis), along with continuation through each step in the service defined as:

1. Having a referral from the OC to the medical department (MD)
2. An accomplished DXA-scan, results and recommendations, along with the time between the fracture event and the DXA-scan
3. Referral to and follow-up from the patient’s general practitioner (GP), treatment initiation, drug of choice and the time from BMD-testing until follow-up. Adherence to treatment after 12 months was studied through the patient’s medical prescriptions for oral drugs, and as an appointment for a renewed infusion for intravenous drugs.

**Organization of the FLS**

Secretaries at the OC identified patients through the diagnostic codes defining the visits, both when writing the discharge dictates and also by monthly lists of all diagnostic codes eligible for inclusion. To include a patient, a standardized referral was sent to the MD after the secretary had gathered a signature from the patient-responsible orthopedist, and an informing letter was sent to the patient. The MD invited the patient to a DXA-scan, along with a self-report questionnaire checking for osteoporosis risk factors (heredity, previous fractures, smoking, glucocorticoid use, comorbidities, decrease in height, physical inactivity, dietary intake of calcium and vitamin D and for women age of menopause and use of contraceptives) and previous actions (DXA-scans, ongoing anti-osteoporotic treatment) supposed to be brought by the patient to the appointment. BMD was measured in the hips and the lumbar spine. A potential treatment recommendation was made from an endocrinologist based on the integration of BMD-results and the questionnaire, serving as a prediction for risk of future fractures. In relevant cases it was then sent to the patient’s GP for treatment initiation.
Statistical analysis
Statistical analysis was performed using SPSS version 25. Main objectives were all descriptive and so descriptive statistics were used for both quantitative parameters (mean and standard deviations (SD)) and for qualitative parameters (percentages). Various subgroups were compared using chi-square test for categorical variables and independent t-test for continuous variables. Limit of significance was p<0.05. Odds ratios (OR) and 95% confidence intervals (CI) were calculated for associations.

Ethics
This study was made as a retrospective examination of medical records, with no approval from the patients. Documents containing personal identity numbers were accessible only through the author’s personal inlog, and all data was handled at the MD. As for the report, all data were unidentified and results were presented at group level. The well-known insufficient secondary prevention of osteoporosis calls for an effort to map out the gaps. For this reason, the present study was created as a quality assessment and was approved by the directors of both the OC in Örebro County and the MD at Örebro University Hospital, hence no formal approval was needed.

Results
Baseline characteristics
A total of 1269 fractures to the specified sites among patients 50-85 years old were registered in Örebro County in 2016. 531 patients did not meet inclusion criteria, according to documentation in the medical records. Thus, 738 patients were included in our study, mean age 71.00 (±9.16) years, 565 (76.6%) women and 173 (23.4%) men. The most common fracture sites were the wrist (38.3%), hip (30.0%) and upper arm (21.5%), whereas a vertebra (9.5%) and the pelvis (0.7%) were less common. Demographic data and fracture site distribution are summarized in Table 1.
Table 1: Demographic data and fracture site distribution in the study population

<table>
<thead>
<tr>
<th>Mean age: years (SD)</th>
<th>71.00 (9.16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender: n (%)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>565 (76.6)</td>
</tr>
<tr>
<td>Male</td>
<td>173 (23.4)</td>
</tr>
<tr>
<td>Age by decade: n (%)</td>
<td></td>
</tr>
<tr>
<td>50-59</td>
<td>105 (14.2)</td>
</tr>
<tr>
<td>60-69</td>
<td>191 (25.9)</td>
</tr>
<tr>
<td>70-79</td>
<td>285 (38.6)</td>
</tr>
<tr>
<td>80-85</td>
<td>157 (21.3)</td>
</tr>
<tr>
<td>Fracture site: n (%)</td>
<td></td>
</tr>
<tr>
<td>Wrist</td>
<td>283 (38.3)</td>
</tr>
<tr>
<td>Hip</td>
<td>221 (30.0)</td>
</tr>
<tr>
<td>Upper arm</td>
<td>159 (21.5)</td>
</tr>
<tr>
<td>Vertebra</td>
<td>70 (9.5)</td>
</tr>
<tr>
<td>Pelvis</td>
<td>5 (0.7)</td>
</tr>
</tbody>
</table>

BMD testing and treatment recommendations

Progresses and losses through the FLS are summarized in Figure 1. Of the 738 included patients, 391 (53.0%) had a referral to the MD for investigation according to the FLS guidelines. For the remaining 347 patients, no standpoint regarding inclusion or exclusion was to be found in the medical records, and no further investigation or follow-up in the FLS was recorded. However, 19 (5.5%) of these had a later referral to the MD from their GP after the discovery of them not being included despite sustaining a low trauma fracture, and all of them underwent DXA-scanning. Of the 391 patients referred to DXA in the FLS, 348 (89.0%) had a DXA-scan. 2 referrals were declined by the MD. Reasons for the 43 absent DXA measurements were not to be found in the medical records and could thus be attributed either to the MD not making appointments with these patients or to the patients declining and/or not attending their appointments. For the 348 patients measured by DXA, treatment was recommended in 253 (72.7%) cases and not considered necessary in the remaining 95 (27.3%). The mean time from the fracture event until BMD-testing was 4.54 (±2.35) months.
Figure 1. Progresses and losses through the Fracture Liaison Service.

**Treatment initiation, drug of choice, follow-up time and adherence to treatment**

Of the 253 patients in whom treatment was considered necessary, it was initiated in 194 (76.7%). Reasons for non-initiation were as follows:
- 6 patients had no referral to their GP.
- 18 patients were referred but never followed up from their GP.
- In 5 cases, patients were followed up but treatment was not initiated despite the recommendation.
- In another 9 cases, patients went through the follow-up but declined any treatment.
- In 19 cases, we were unable to track the follow-up and possible treatment initiation due to patients having private primary health care providers where we did not have access to their medical records.
- 2 patients died before any visit to the primary care.

This is equivalent to a treatment initiation rate by the primary care of 85.8% of all patients eventually referred there (deaths and patients with private health care providers excluded). Of the 194 patients receiving treatment, 125 (64.4%) were prescribed once weekly oral bisphosphonates, 66 (34.0%) were given once yearly intravenous zoledronic acid and 3
(1.6%) were given twice yearly subcutaneous (sc) denosumab. The mean time from BMD-testing to treatment initiation was 2.51 (±2.01) months, thereby making the total FLS mean time 6.95 (±3.03) months. At treatment follow-up after 12 months, 18 patients had to be excluded because less than a year had passed since the first prescription and/or infusion. Of the excluded patients, 4 were prescribed oral drugs and 14 intravenous drugs. Data regarding adherence to treatment after one year were thus available for 176 patients, 121 given oral drugs and 55 given intravenous/subcutaneous medication. A total of 119 (67.6%) patients were still adhering to their treatment. Of those prescribed oral bisphosphonates (n=121) 76 (62.8%) did still adhere (although three changed to iv administration), whereas among those given intravenous/subcutaneous treatment (n=55), 42 (76.4%) did have a renewed infusion after one year. Reasons for not adhering were 5 cases of death, and among the 52 remaining patients reasons were unknown. Outcome in each step of the FLS is summarized in Table 2.

Table 2. Outcome in each step of the Fracture Liaison Service (FLS).

<table>
<thead>
<tr>
<th>Part of the FLS</th>
<th>N (% of total group)</th>
<th>% of previous step in the FLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meeting inclusion criteria</td>
<td>738 (100)</td>
<td></td>
</tr>
<tr>
<td>Referred to DXA</td>
<td>391 (53.0)</td>
<td>53.0</td>
</tr>
<tr>
<td>DXA-scan</td>
<td>348 (47.2)</td>
<td>89.0</td>
</tr>
<tr>
<td>Treatment recommended</td>
<td>253 (34.3)</td>
<td>72.7</td>
</tr>
<tr>
<td>Treatment initiated</td>
<td>194 (26.3)</td>
<td>76.7</td>
</tr>
<tr>
<td>Oral Bisphosphonates</td>
<td>125 (16.9)</td>
<td>64.4</td>
</tr>
<tr>
<td>iv. Zoledronic acid</td>
<td>66 (8.9)</td>
<td>34.0</td>
</tr>
<tr>
<td>sc. Denosumab</td>
<td>3 (0.4)</td>
<td>1.6</td>
</tr>
<tr>
<td>Adherance after 12 months</td>
<td>119 (16.1)</td>
<td>67.6*</td>
</tr>
</tbody>
</table>

* Data regarding adherence to treatment after 12 months was only available for 176 patients.
Subgroup analysis

1. DXA-referrals

Mean age in patients referred to DXA-scanning was slightly lower than in those included but not referred, and women were proportionally more often referred than men. The distribution of fracture sites varied significantly among the groups, where vertebra- and pelvic fractures more often remained un-identified. Characteristics and distribution of fractures are compared in Table 3.

Table 3. Characteristics and fracture distribution in patients referred and not referred to dual energy X-ray absorptiometry (DXA).

<table>
<thead>
<tr>
<th></th>
<th>Referred to DXA</th>
<th>Not referred to DXA</th>
<th>All patients</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (%)</td>
<td>391 (53.0)</td>
<td>347 (47.0)</td>
<td>738</td>
<td></td>
</tr>
<tr>
<td>Female (%)</td>
<td>81.6</td>
<td>71.5</td>
<td>76.6</td>
<td>0.001</td>
</tr>
<tr>
<td>Male (%)</td>
<td>18.4</td>
<td>28.5</td>
<td>23.4</td>
<td>0.001</td>
</tr>
<tr>
<td>Mean age (±SD)</td>
<td>70.32 (8.90)</td>
<td>71.69 (9.39)</td>
<td>71.00 (9.16)</td>
<td>0.079</td>
</tr>
<tr>
<td>Fracture site (%)</td>
<td></td>
<td></td>
<td></td>
<td>0.005</td>
</tr>
<tr>
<td>Wrist</td>
<td>41.4</td>
<td>34.9</td>
<td>38.3</td>
<td></td>
</tr>
<tr>
<td>Hip</td>
<td>31.2</td>
<td>28.7</td>
<td>30.0</td>
<td></td>
</tr>
<tr>
<td>Upper arm</td>
<td>21.0</td>
<td>22.0</td>
<td>21.5</td>
<td></td>
</tr>
<tr>
<td>Vertebra</td>
<td>5.9</td>
<td>13.5</td>
<td>9.5</td>
<td></td>
</tr>
<tr>
<td>Pelvis</td>
<td>0.5</td>
<td>0.9</td>
<td>0.7</td>
<td></td>
</tr>
</tbody>
</table>

2. Treatment recommendations

Mean age in patients recommended treatment was 72.41 (±7.34) years, compared to 62.62 (±9.07) in those where it was not indicated (p<0.001). The gender distribution was similar between the two groups, 83.0% women and 17.0% men in the group recommended treatment, compared to 82.1% women and 17.9% men in the group with healthy BMD (p=0.843). The proportion of treatment recommendations varied with fractured site. As shown in Figure 2, the likelihood of a patient with a fractured hip, vertebra or pelvis to be osteoporotic exceeded that of a fractured wrist or upper arm. OR 16.76 (95% CI 6.59-42.64).
Discussion

Secondary prevention of osteoporosis constitutes a priority to the public health. The main aim of our study was to survey to what extent investigation and treatment took place after a fragility fracture in Örebro County. During 2016, 738 patients met inclusion criteria for the FLS. 53.0% were referred to DXA, 47.2% had a DXA-scan, 34.3% had a treatment recommendation and 26.3% received treatment. Thus, the major gap in the FLS appeared to be identification of patients at risk of osteoporosis and the referral of them further on in the program. Once passed the identification step, losses through the program were in smaller proportions.

Several of our findings were in line with those of other studies. Women suffered three times more fragility fractures than men. Most common were wrist fractures. A fractured hip or vertebra were more likely to indicate osteoporosis [30,31] and women were proportionally more likely to have a DXA-referral than men [32].

When comparing our efficacy to that of other international studies, the patient recruitment rate, measured as DXA-referral rate, has ranged from 38.2% in Thailand [32] to 38.4% in France [33], 50.6% in the Netherlands [34], 63.0% in Switzerland [35] and 70.8% in Scotland [30]. Our rate of 53.0% is therefore in parity with international FLS centers. A similar Swedish study with 2616 patients (mean age 76.7 ±11.6 years) made in 2013-2014, with the
same structure of secretaries identifying patients and referring them to BMD-testing, and treatment being initiated after referral to the primary care, reported a higher identification rate of 75.0% [36]. On the other hand, only 39.6% of their patients had a DXA-scan, whereas we measured 47.2% of our included patients. A possible explanation to their bigger loss could be that they, during the second half of their study time, had the opportunity to immediately initiate treatment with intravenous zoledronic acid to the oldest and most ill patient group (>80 years) without a previous DXA-scan. In addition, they did not have an upper age limit, and thus a higher proportion of patients could be too ill to attend their DXA-scan appointments. Regarding treatment initiation rate, they reported that 31.8% of their studied population received treatment, compared to 26.3% in our study. There was, however, a firmly large amount of our patients that had private primary health care providers and if they did all eventually receive treatment, our treated share would increase. Comparing the time of the process, they reported a shorter mean time, 2.83 (±2.23) months, from the fracture until the DXA-scan, our being 4.54 (±2.35) months. From DXA-scan until treatment initiation took in their study 3.93 (±2.63) months, compared to 2.51 (±2.01) in ours. The short time until follow-up in combination with a treatment initiation rate of 85.8% of all patients referred there, suggests a highly effective primary health care system in Örebro County in this regard.

Despite the big loss of patients never referred for investigation, the prevalence of treatment recommendations (i.e. osteoporosis) was 34.3% in our whole study population. A big population-based study from Rotterdam screened 7806 women and men over 55 years and found the prevalence of osteoporosis to be 29.1% in women and 12.1% in men. Our prevalence of 34.3% therefore confirms the FLS as a case-finding system for osteoporosis in patients suffering fragility fractures. Since 72.7% of all patients measured by DXA were also considered in need of treatment, an improved referral rate would most likely strengthen the importance of the FLS even further. The rate of treatment recommendation in patients measured by DXA has varied widely in different studies, partly due to different thresholds for initiation and partly due to slightly different inclusion criteria in the studies. A Dutch study found only 39.6% of measured patients to need treatment [31], possibly explained by them having a definite treatment initiation limit at a BMD of -2,5SD or less and by the fact that they included low trauma fracture patients of all ages, generating a higher proportion of young patients with a healthy BMD. A French study reported treatment to be indicated in 72.0% of measured patients, equal to our result. Their FLS resembled ours in many aspects, as did the integrated assessment of BMD and risk factor profile as a guidance to treatment
initiation [33]. In several studies the treatment recommendation rate has on the other hand been higher than in ours, for example 85.9% in a study from Thailand with the limit at the BMD of osteopenia (-1 to -2.5SD) [32]. The previously mentioned Swedish study, working with the same concept and the same treatment guidelines reported a significantly higher identification rate, but only a slightly higher treatment initiation rate. The thesis that a higher rate of patient recruitment would gender a higher number of treated patients is therefore somewhat complicated to prove. What aggravates the conclusion even further is that the net outcome depends on many different instances, of which the resources may vary from time to time.

Of all patients receiving treatment, 67.6% were still adhering to it after 12 months. Adherence was a bit higher for intravenous drugs (76.4%) than for once weekly oral drugs (62.8%). These results are similar or slightly below those reported by others, ranging from 65.0% in the US [37] to 74.1% in France [33] and up to 88.0% in the Netherlands [34]. Reasons for discontinuation were largely unknown since the outcome was measured as a renewal of the prescription. Certainly, there may be several reasons for non-renewals, attributable to both patients and GP´s. Active participation from the GP at follow-up may help resolve this problem. When patients report side effects and/or discontinuation there should be an offer to change to a differently administered treatment. Also, a systematic follow-up during the first 6-12 months could both help patients to adhere to and doctors to renew prescriptions.

Our study has several limitations. The large group of patients for whom no statement regarding inclusion or exclusion in the FLS were to be found, make up a potential distortion to the results. For a total of 1269 fracture patients, 391 had it specified in the records to be included and 531 had it specified that inclusion criteria were unmet. Thus, 347 were missing a statement. On the other hand, we have now assumed that they were all supposed to be included and therefore our results show the worst-case scenario. Regardless, this missing data constitutes an obstacle to report the exact efficacy of the FLS. Another limitation is that adherence to treatment was measured as continued or renewed prescription for oral drugs, which constituted the majority of the treatment. This may both over- and underestimate the true adherence, since a renewal is no guarantee that the patient is actually taking the prescribed drug and vice versa. A more accurate result would be acquired through questionnaires, even if that as well could be associated with certain biases, but since our study was made retrospectively there were no such possibilities. In addition, anti-osteoporotic
medication is recommended for 3-5 years to fulfill its effect, hence our short time until follow-up of adherence does not necessarily tell if the FLS did achieve its potential fracture protective effect. What strengthens our study is the large patient group, and that we included all fracture types usually accounted for in terms of osteoporosis. Moreover, a retrospective study surveying an intervention eliminates suggestible extra effort being made to demonstrate satisfying results.

All put together, the efficacy of the FLS in Örebro County seems to be in line with national and international counterparts. Still, there is room for improvement. Patients with low energy fractures constitute a unique opportunity to capture and break the fracture cycle. If missed at the time of the fracture event, so is often the opportunity for treatment intervention. First and foremost, in Örebro County an effort should be made to identify more than half of all patients with a low trauma fracture. Thereafter remains to evaluate if the downstream instances have resources enough to keep up their high rates of following up referred patients. Despite proven efficacy of running an FLS program in terms of investigation and treatment rates, the cost effectiveness of our program remains to be studied.
References


Populärvetenskaplig sammanfattning

Endast 53 % av alla äldre som drabbas av en fraktur till följd av minimalt trauma, får möjlighet till utredning och i förlängningen läkemedelsbehandling i region Örebro län. Detta redovisas i denna studie vid Örebro universitet där man utvärderat den frakturkedja som funnits sedan 2007 i syfte att på ett strukturerat sätt hitta, utreda och behandla bensköra patienter. För de som givits möjlighet till utredning, har behandling varit indicerad i 72,7% av fallen, av vilka 76,7% också erhållit detta. Resultaten bekräftar frakturkedjan som ett effektivt verktyg i att fånga upp patienter med benskörhet då förekomsten av detta i studiepopulationen, trots det stora bortfallet av icke identifierade patienter, överstiger den som rapporterats i populationsbaserade studier på samma åldersgrupp – men faktum kvarstår att det finns rum för förbättring.

En benskörhetsfraktur drabbar varannan kvinna och var fjärde man i Sverige. Dessa frakturer medför en bytande ökning av mortalitet och morbiditet i efterförloppet, och är dessutom starka riskfaktorer för ytterligare frakturer. En tidig och effektiv sekundärprevention är av stor betydelse, både för den enskilda patienten, men också för att vårdkostnaderna uppgår till 5 miljarder kronor årligen i Sverige. En fragilitetsfraktur utgör en unik möjlighet att fånga in och bryta denna onda cirkel. Missas detta vid frakturtillfället, förloras ofta också möjligheten till intervention. Först och främst bör region Örebro län se över möjligheterna att fånga upp mer än hälften av alla patienter med fragilitetsfrakturer – därefter återstår att se om instansen senare i vårdkedjan har resurser nog för att upprätthålla sina höga utrednings-respektive behandlingsfrekvenser.
Cover letter

Osteoporosis International
400 Market Street Suite 700
19106 Philadelphia, USA

Dear Editors,

Please consider the enclosed manuscript "Investigation and treatment after an osteoporotic fracture: A survey of the Fracture Liaison Service in Örebro County" for publication in Osteoporosis International.

This retrospective examination of medical records evaluate the efficacy of a Swedish FLS built-up by multiple instances co-working throughout the process, and with a minimal resource concept starting by orthopaedic secretaries vouching the patient identification and referral for investigation, and finishing with treatment initiation from the primary health care.

The main finding was that only 53% of all eligible patients were identified and referred, while the losses downstream in the program were in smaller proportions. 34.3% of the study population were considered in need of treatment, which confirms our FLS-program as a case-finding system for osteoporosis in fragility fracture patients, since it exceeds the prevalence reported in population-based studies on the same age group.

There are several reasons why I believe this study could be of interest to your readers. First and foremost, most studies made on FLS efficacy are made as interventions. This study was made 9 years after the implementation of the FLS, thus the bias of extra effort being made to show satisfying results was excluded. In addition, the somewhat different concept of the service, based on minimal resources with no additional staff hired, may be of interest to many regions with limited resources considering implementing a structured way of managing the elderly suffering fragility fractures.

Yours Sincerely

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Etisk reflektion


Framtagen data har gällt beslut och åtgärder som vårdkedjan vidtagit. All data har avidentifierats och enbart presenterats på gruppnivå, vilket förhoppningsvis förhindrar att den enskilda patienten upplever en integritetsförlust. För att säkerställa att information enbart hanterats av personer involverade i studien, och så få till antalet som möjligt, har personnummer tagits fram av ansvarig sekreterare och därefter varit tillgängliga endast från författarens inloggning och hanterats på dator tillhörande medicinkliniken.

Den höga prevalensen av osteoporos, den ökade mortaliteten och morbiditeten det bidrar till, samt dess stora konsumtion av vårdresurser gör det angeläget att se över eventuella möjligheter till förbättring i omhändertagandet av de patienter som drabbas. De enskilda patienterna i vår studie har inte gynnats på ett direkt sätt av sitt deltagande, men däremot kan ett stort antal framtida patienter dra nytta av ett förbättrat system för sekundär prevention av denna folksjukdom.