A Secondary Fracture Prevention Programme to Reduce Fractures, Hospital Admissions, and Mortality Rates

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Introduction:

Osteoporosis patients with a prior fracture have a higher risk of re-fracture. Anti-osteoporosis medications reduce fractures only with prolonged treatment In 2000, a Secondary Fracture Prevention Programme was piloted in Queen Mary Hospital to evaluate and treat patients with osteoporotic fractures.

Objectives:

1) To triage and identify post-fracture patients with good survival and quality of life to minimize unnecessary osteoporosis drug treatment;
2) To reduce re-fractures;
3) To minimize hospital admissions;
4) To reduce mortality with osteoporosis drug treatment;
5) To lower cost for hospitals to treat preventable re-fractures.

Methodology:

Patients with low traumatic fractures underwent a structured evaluation and triage system for treatment and systematic follow-up programme. The triage was done by a registered nurse in-charged of the programme. Outcome measures include: (1) Re-fracture rate, (2) Re-admission rate, (3) Mortality rate at 1-, 5-, and 10–years, using survival analysis.

Results:

2,364 (1606 female and 758 male) fracture patients admitted to Queen Mary Hospital between 1999 and 2009 were screened. 1,078 (45.6%) had hip fractures, 565 (23.9%) spine fractures, 311 (13.2%) distal radius fractures and 410 (17.3%) fractures at other sites. 80.2% of patients fulfilled the inclusion criteria and were included into the program. About 80% of these patients were started on anti-osteoporotic medications.

The re-fracture rate at 1-, 5-, and 10-years of patients who received anti-osteoporosis medications were significantly lower than those did not receive medications (both $p<0.05$). Patients who satisfied the inclusion criteria but did not receive anti-osteoporosis medications had significantly higher re-admission and mortality rates at 1, 5, and 10 years (all $p<0.05$). Patients who were excluded from the program have significantly lower re-fracture rate but higher re-admission and mortality rates due to other causes at all time-points (all $p<0.05$) (Figure 1, 2, and 3).

Anti-osteoporosis medications reduced risk of hip fractures by 88.8%, spine fractures by 88.3%, and other fractures by 82.8% at 12 months. The average cost of bisphosphonates, an effective anti-osteoporosis medication, is $1,400/patient-year. The Hospital Authority statistical report for 2007 recorded a total of 25,713 fractures. Based on these data, the secondary fracture prevention programme is estimated to provide a cost-saving of $100,260,300 per year.

Conclusion:

A structured triage and management programme for secondary fracture prevention was effective in identifying patients with better quality of life who are more likely to benefit from anti-osteoporosis medication, therefore reducing unnecessary drug prescription. Judicial use of anti-osteoporosis agents was effective in reducing re-fractures, re-admissions and mortality and achieving cost-savings.

Figure 1. Re-fracture Rates if patients included into the Programme

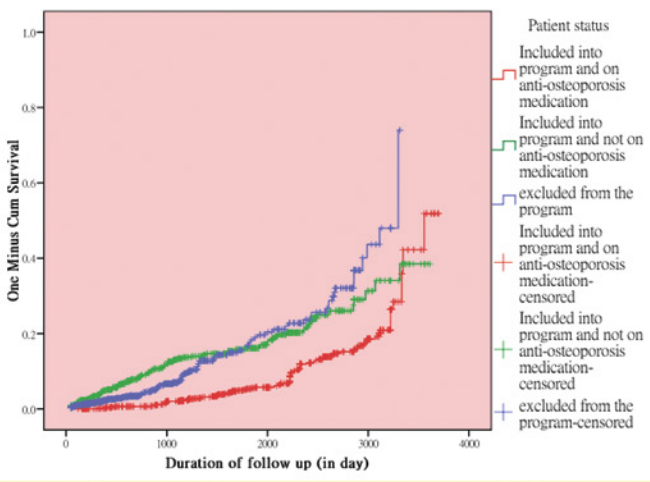

Figure 2. Mortality Rates if patients included into the Programme

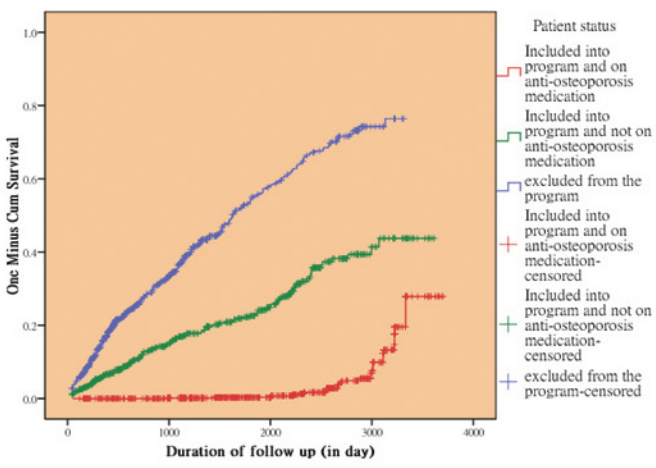

Figure 3. Re-admission Rates if patients included into the Programme