An Effective Advanced Triaging System in Osteoporosis Management: Early Identification of High Cardiovascular Risk amongst Osteoporotic patients treated with Strontium Ranelate

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What is Osteoporosis?

- Osteoporosis is a disease in which the density and quality of bone are reduced.
- When bones become more porous and fragile, the risk of fracture is greatly increased.
Diagnosis of Osteoporosis

- Dual-energy X-ray absorptiometry (DXA) is the gold standard for diagnosis of osteoporosis.
Around the world:

- 1 in 3 women and 1 in 5 men, are at risk of an osteoporotic fracture.
- An osteoporotic fracture is estimated to occur every 3 seconds.

Source: IOF website - http://www.iofbonehealth.org/what-is-osteoporosis
In our Society ..... 
Ageing population are expected to increase the prevalence of Osteoporosis and associated Fractures
Osteoporotic hip fractures worldwide will rise from 1.66 million in 1990 to 6.26 million in 2050.

Any possible ways to avoid ...?

Many osteoporotic fractures can be avoided by 2As + 2Es:

- Appropriate medical treatment
- Adequate health promotion
- Early diagnosis of Osteoporosis
- Early identification of primary and secondary causes of Osteoporosis
Goal of Anti-Osteoporosis Pharmacological Treatment ......

Reduce fracture risk
Increase survival
Improve quality of life
What are we facing in HK?

Waiting time for Specialist Clinic has risen because of our aging population.

Source: Mandatory Provident Fund Schemes Authority
What we need?

An effective health care referral system is required to meet the growing demand of service.
What we done? ..... 

Since 2012, in Osteoporosis Specialist Clinic
Division of Endocrinology and Metabolism
Queen Mary Hospital:
Advanced Osteoporosis Triage System (AOTS)
has been commenced
Under the Advanced Osteoporosis Triage System (AOTS) Patients were triaged by a nurse according to protocol under-supervised by Endocrinologist ….

Case Manager: Nurse

Clinical Management Protocol:
Advanced Osteoporosis Triage System (AOTS)

Result
Early Identification
High-risk Group
Effectiveness of the AOTS

Advanced Osteoporosis Triage System (AOTS) demonstrates as an effective model to:

- enhances the provision of specialist service to the most appropriate patients in a more timely way
- shorten the clinic waiting time
- help in early identification of underlying disease

Loong CHN, Woo YC, Hui E, Leung ELY, Yee SW, Lam KSL, Tan KCB. Advanced Osteoporosis Triage System Shortens the Waiting Time for Osteoporosis Clinic. Hospital Authority Convention 2014 - Young HA Investigators Session (SPP8-5-Oral Presentation)
What has happened .....?
In 4.2013 ...

The European Medicines Agency (EMA) recommended:

- a restriction in the use of Strontium Ranelate, one of the anti-osteoporotic agents
- following data showing an increased risk of myocardial infarction
What has been done ......

The AOTS model was applied:

- to identify all patients taking Strontium Ranelate for the necessity of early medical consultation
Objective of our study

• To evaluate the effectiveness of the AOTS model in patient management secondary to newly identified side effects of drugs.
All patients taking Strontium Ranelate in Osteoporosis Clinic

Case Manager: Nurse

Clinical Management Protocol: Advanced Osteoporosis Triage System (AOTS)

High-risk Group
Indeterminate Group
Low-risk Group
High-risk Group

1. Stroke
2. Angina
3. Ischemic heart disease
4. Peripheral arterial disease, or
5. Hypertension requiring multiple drugs

> ad-hoc outpatient appointments were offered
Indeterminate Group

- Suspected cases without clear documentation of the aforementioned diseases were considered
- Patient’s medical information were discussed with an Endocrinologist, and re-triaging
Low-risk Group

- none of the above diseases identified

⇒ their original follow-up appointments were kept
Outcome measurements

• The time to the ad-hoc medical consultation for the High-risk group were compared with the waiting time of their own scheduled follow-up, and that of the low-risk patients.

• Cardiovascular events and fracture of the subjects were monitored and compared.
Results .....
Results

Case Manager: Nurse

Clinical Management Protocol:
Advanced Osteoporosis Triage System (AOTS)

139 patients on Strontium with a mean duration of 24±19 months
133 female (96%), mean age 78±9 years

High-risk Group

41 patients (29%):
1. Cerebrovascular disease (n=20)
2. Ischemic heart disease (n=19)
3. Peripheral arterial disease (n=2)

Low-risk Group

98 patients (71%):
1. none of the cardiovascular disease was identified
<table>
<thead>
<tr>
<th>High-risk Group</th>
<th>Low-risk Group</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>6±3 weeks</td>
<td>16±8 weeks</td>
<td>&lt;0.001</td>
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Waiting time for medical consultation

High-risk group:

<table>
<thead>
<tr>
<th>Ad-hoc follow-up</th>
<th>Original follow-up</th>
<th>p</th>
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</thead>
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<tr>
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</tbody>
</table>
Outcomes ..... 

• Only 41 extra ad-hoc outpatient appointments were added for High-risk Group

• All of them had Strontium Ranelate discontinued after medical consultation

• Alternative anti-osteoporosis medications were commenced
After a period of 17 ± 2 months, among the 139 patients:

1. Cardiovascular events: n=4 (0.3%)
   - High-risk Group: 4 vs. Low-risk Group: 0 (p=0.002)

2. New fracture: n= 7 (0.5%)
   - High-risk Group: 2 vs. Low-risk Group: 5 (p=0.95)
Conclusion

The Advanced Osteoporosis Triage System (AOTS) functioned well:

1. In identifying and stratifying patients according to their risk for further clinical management
2. As the case manager, the nurse plays a vital role in the AOTS
3. Multi-disciplinary approached health care model has been demonstrated to improve quality of patient care
Acknowledgement

Division of Endocrinology and Metabolism
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Queen Mary Hospital
HONG KONG

Thank you