

Pharmacy-led Education Is Sufficient In Reducing Medication Administration Errors Related To Inpatient Colecalciferol Dosing



Background

Osteoporosis is one of the leading conditions that is both under-diagnosed and undertreated by general practitioners in Australia (1). A common misconception amongst nursing and other healthcare disciplines is that it is of low clinical priority (2). However, the complications associated with osteoporosis are potentially fatal. The condition primarily affects the geriatric population, with its prevalence increasing in Australia alongside the ageing population (3).

Fractures as a result of osteoporosis can be fatal, with approximately 33% of all adults (over 55 years) dying within 12 months post hip fracture (4). In addition, fractures pose a significant risk to an individual's mobility, independence and increases the risk of depression (5,6). Furthermore, it has been noted that fractures post fall can prolong patient hospital admission by approximately 18.8 days (7), increase strain on the healthcare system and presents a considerable cost to the Australian government (approximately \$3 billion annually) (8).

The geriatric and endocrinology departments at a Sydney tertiary hospital developed an osteoporosis treatment protocol in patients admitted due to hip fracture. As per the protocol, eligible inpatients receive intravenous zoledronic acid, requiring replete serum vitamin D levels ($\geq 50\text{nmol/L}$) prior to administration. In order to prevent hypocalcaemia, patients with suboptimal serum vitamin D levels were subsequently prescribed a five-day course of colecalciferol 50,000IU (1.25mg) capsule daily. Colecalciferol 50,000IU would then be dispensed by the hospital pharmacy and supplied to the ward.

However, pharmacy dispensing data indicated that patients were administered colecalciferol 50,000IU, despite it not being dispensed. It became apparent that a selection error had occurred whereby nursing staff (NS) were administering readily available imprest colecalciferol 1000IU tablets, instead of the 50,000IU strength. This subsequently delayed zoledronic acid treatment, compromising patient safety, leading to sub-optimal osteoporosis management and thereby prolonging hospital stay.

Objective

To evaluate a pharmacy-led quality improvement plan directed at NS to ensure safe medication administration, increase nursing confidence, and ensure patients receive safe and effective osteoporosis treatment.

Action

NS from a 500-bed tertiary hospital geriatric ward were targeted to identify potential reasons for administration errors related to colecalciferol. Clinical nurse educators and nurse unit manager were informed and involved in discussing contributing factors to the selection error.

Issues included lack of NS education of available colecalciferol strengths, limited confidence in dosage selection and unclear documentation by the medical team. To address this, NS education was provided by ward pharmacists to raise awareness of available colecalciferol strengths and indications.

The colecalciferol ward imprest stock was affixed with a warning label alerting high error prone medication (Figure 1.), in addition to dosage conversions (between International Units and micrograms). Lastly, the geriatric medical teams were educated to use the available eMeds order sentence for the colecalciferol 50,000IU 5-day course, clearly stating the intended strength.



Figure 1. Image of colecalciferol 1,000IU ward imprest stock affixed with a warning label

Evaluation

A pre and post implementation questionnaire was conducted to evaluate existing NS knowledge and effectiveness of the education presentation. The post implementation questionnaire attained 100% correct answers from all NS who attended the education sessions (n= 12). These results highlight the considerable effectiveness of the intervention. Three months post intervention, no medication errors relating to incorrect colecalciferol dose administration have been observed since implementation.

Discussion

Administration of the correct strength of colecalciferol ensures patients receive zoledronic acid infusion in a timely manner, and thus prevent delay of appropriate osteoporosis therapy. This reduces hospital stay and improves patient outcomes. This pharmacy-led intervention, targeting a multidisciplinary team was shown to be effective in ensuring safe medication administration of colecalciferol, increase nursing confidence and patient safety. This education session will be repeated, whereby obtaining a larger audience will demonstrate its replicability.

References

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