Chelsea and Westminster Hospital
NHS Foundation Trust

Vitamin D single dose loading regime in Neck of Femur Fracture Patients

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Introduction

- Neck of femur fracture (NOFF) are one of the most common fragility fractures, carrying a high morbidity and mortality.
- Best Practice Tariff (BPT) is a pay-performance initiative in the UK for hospital treatment of hip fractures.
- One of the six BPT criteria:

*Fracture prevention assessments: falls and **bone health***

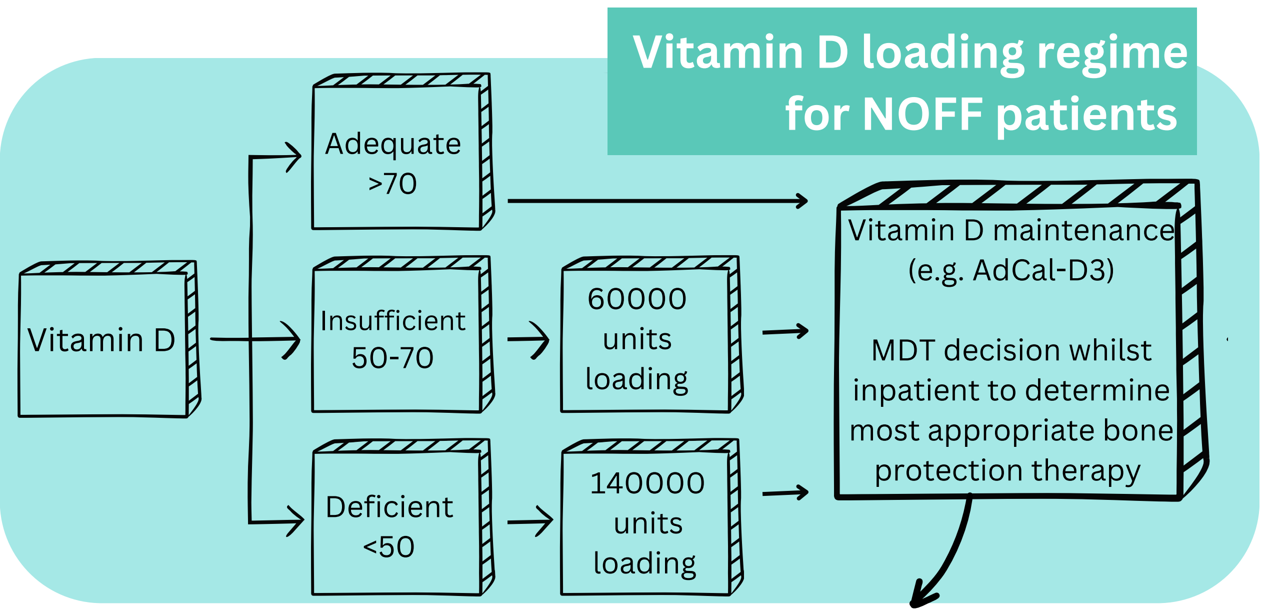
- Bone health treatments such as bisphosphonates require adequate vitamin D levels prior to administration
- The standard vitamin D loading course is 7 weeks, meaning few patients are eligible for initiation of bone protection treatments whilst in hospital

Aims: Audit the treatment of vitamin D and bone health of patients with hip fractures

To review the use of a once only high dose vitamin D loading in facilitating quicker initiation of bone protection treatment

Methods

- Review all NOFF admissions to Chelsea & Westminster Hospital over a 3 month period.
- Data was collected retrospectively to include vitamin D level, bone health treatment eligibility and whether this was administered whilst inpatient.
- A new vitamin D loading regime was implemented over the next 3 months.
- Second cycle was repeated post-intervention.
- At the time of the second cycle, those included in the first cycle were then assessed for re-fracture and if applicable, whether the outpatient bone health appointment had taken place.



1. **Novel anabolic agents** - Romosozumab or Teriparatide - strict criteria including ability to self-inject. Required outpatient rheumatology referral.
2. **Anti-resorptive therapy** with Zoledronic acid or Denosumab dependant on renal function. Aim to administer whilst inpatient with fracture liaison follow up.

Results

Cycle 1:

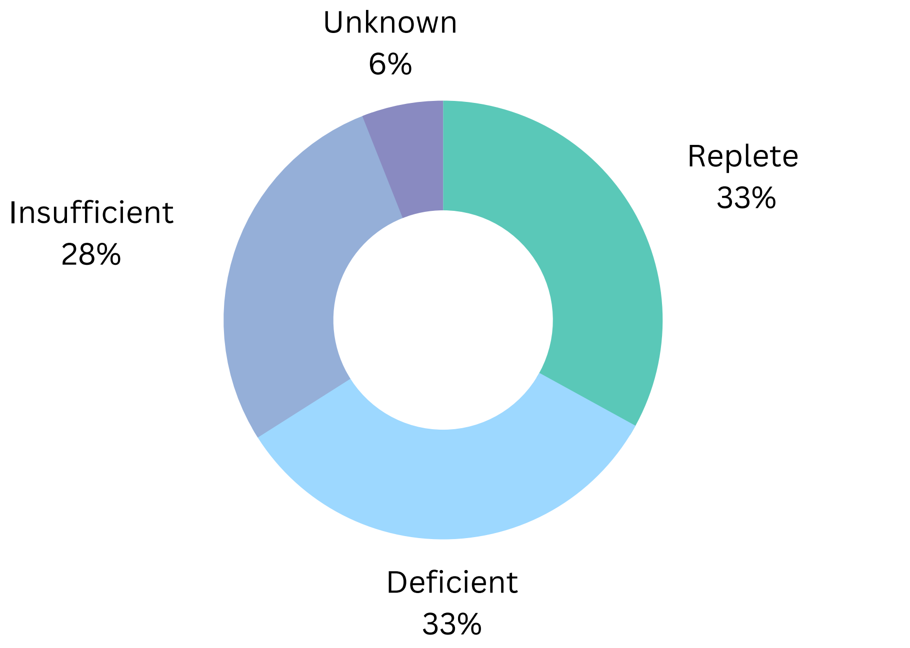


Fig 1: Chart illustrating vitamin D status of NOFF patients admitted to C&W in Cycle 1 (Oct-Dec 2022)
Replete = >70; Insufficient = 50-70, Deficient = <50

- Total of 64 NOFF admissions between October 2022 – December 2022
- 33% (21/64) were vitamin D replete on admission, of which 43% (9/21) received antiresorptive therapy during admission
- The remaining 43 patients were commenced on a 7-week vitamin D loading regime
- 23 patients remained without any bone health treatment at time of re-audit (had not yet attended outpatient bone health appointments).
- 2 of these patients were readmitted with fragility fractures within the following 4 months. both would have been eligible for bone protection treatment but vitamin D levels were inadequate

Cycle 2:

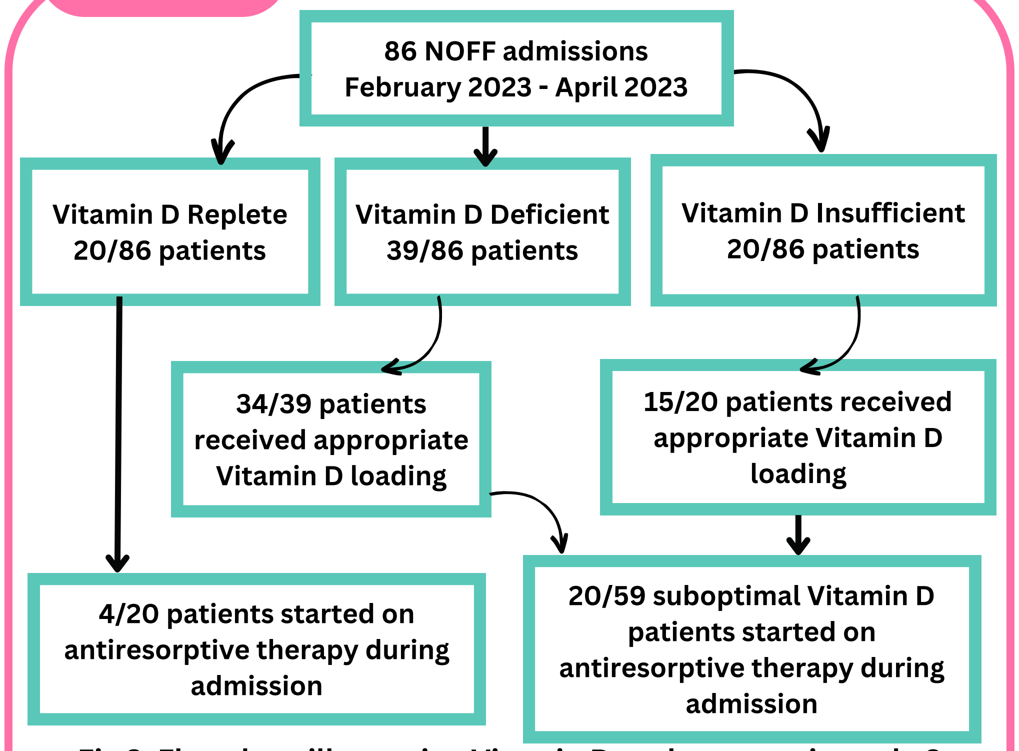


Fig 2: Flowchart illustrating Vitamin D replacement in cycle 2 (February 2023 - April 2023)

- Total of 86 NOFF admissions between February 2023 – April 2023
- 39/86 patients were vitamin D replete on admission, of which 4/20 eligible patients received anti-resorptive therapy during admission
- 34/39 Vitamin D deficient (<50) patients received appropriate single dose loading (140000 units); 15/20 patients with insufficient Vitamin D (50-70) received appropriate loading (60000 units)
- 20/59 patients with suboptimal vitamin D levels on admission received high dose vitamin D replacement and were subsequently commenced on antiresorptive therapy during admission
- 17 patients were suitable for inpatient anti-resorptive treatment but were referred for an outpatient bone health appointment for consideration of novel bone health treatments

Limitations: Fewer patients received inpatient bone protection therapy than expected despite vitamin D loading. The majority of cases were due to junior doctor strikes leading to delay in prescriptions and administration prior to discharge.

Conclusion

3.7 times as many patients received anti-resorptive therapy whilst inpatient following initiation of the new vitamin D loading protocol

Effective management of bone health requires a multi-disciplinary approach from the orthogeriatric team, pharmacists and nurses

- Reduced demand and cost to NHS outpatient services
- Reduced wait times for bone protection therapy
- More efficient patient care

What next?

- Educate doctors, nurses and pharmacists about the new protocol
- Establish the impact of increasing administration of bone health therapy on preventing further fragility fractures
- Consider similar protocols for patients with other fragility fractures such as vertebral or distal radius