

Dr H. Javaid, Dr A. Kirk-Patrick
Intensive Care Unit, Southmead Hospital, North Bristol Trust

Introduction

Critically ill patients deficient in Vitamin D have been shown to have poorer outcomes in observational studies. These include longer length of stay, ventilation time, a higher incidence of sepsis and excess mortality. (1,2,3)

The European Society for Clinical Nutrition and Metabolism (ESPEN) set out 2 recommendations on vitamin D testing in the intensive care unit (ICU) (4).

These include measuring vitamin D levels and supplementing with vitamin D3 if below 50nmol/L. If below this and tested within the first week of admission a single loading dose is recommended. Our local guidelines also recommend supplementation dependent on vitamin D levels and risk factors.

Objectives

Our objectives were to assess how many ICU patients in a one-year period (2020) were tested for vitamin D levels and on which day of admission they were tested. In addition to this our aim was to see if treatment of Vitamin D deficiency/insufficiency was in line with ESPEN and local guidelines.

Methods

Using the Integrated Clinical Environment (ICE) programme we identified all patients who were tested for vitamin D on ICU during 2020. We then used Intensive Care National Audit and Research Centre (ICNARC) data to identify admission and discharge dates.

Using ICE discharge summaries and Electronic Document Management System (EDMS) notes we established those that were prescribed replacement and whether this occurred on the ICU or on the ward after discharge. In accordance with local and NICE (5) guidelines those with vitamin D levels under 25nmol/L were deemed deficient and those between 25-50nmol/L were deemed insufficient.

Results

- 59 patients were tested for Vitamin D levels on ICU during 2020
- 31 patients were defined as insufficient
- 16 patients were defined as deficient (Fig. 1)
- There was a wide range of days on which patients were tested, from day 0 of admission to day 88
- The mean day of testing was Day 15

Results

Vitamin D deficiency:

- Treatment was commenced in 11 of these 16 patients
- 4 patients were not started on treatment (Fig. 2)
- Treatment was started in ICU in 5 of these 11 patients (Fig. 2)
- Of these 5, only 2 patients were commenced on treatment as per trust guidelines (Fig. 3)

Vitamin D insufficiency:

- Treatment was commenced in 10 of these 31 patients
- 21 patients were not commenced on treatment (Fig. 2) - 4 of these patients died during hospital admission
- Treatment was started in ICU in 6 of these 10 patients (Fig. 2)
- Of these 6, only 2 patients were commenced on treatment as per trust guidelines (Fig. 3)

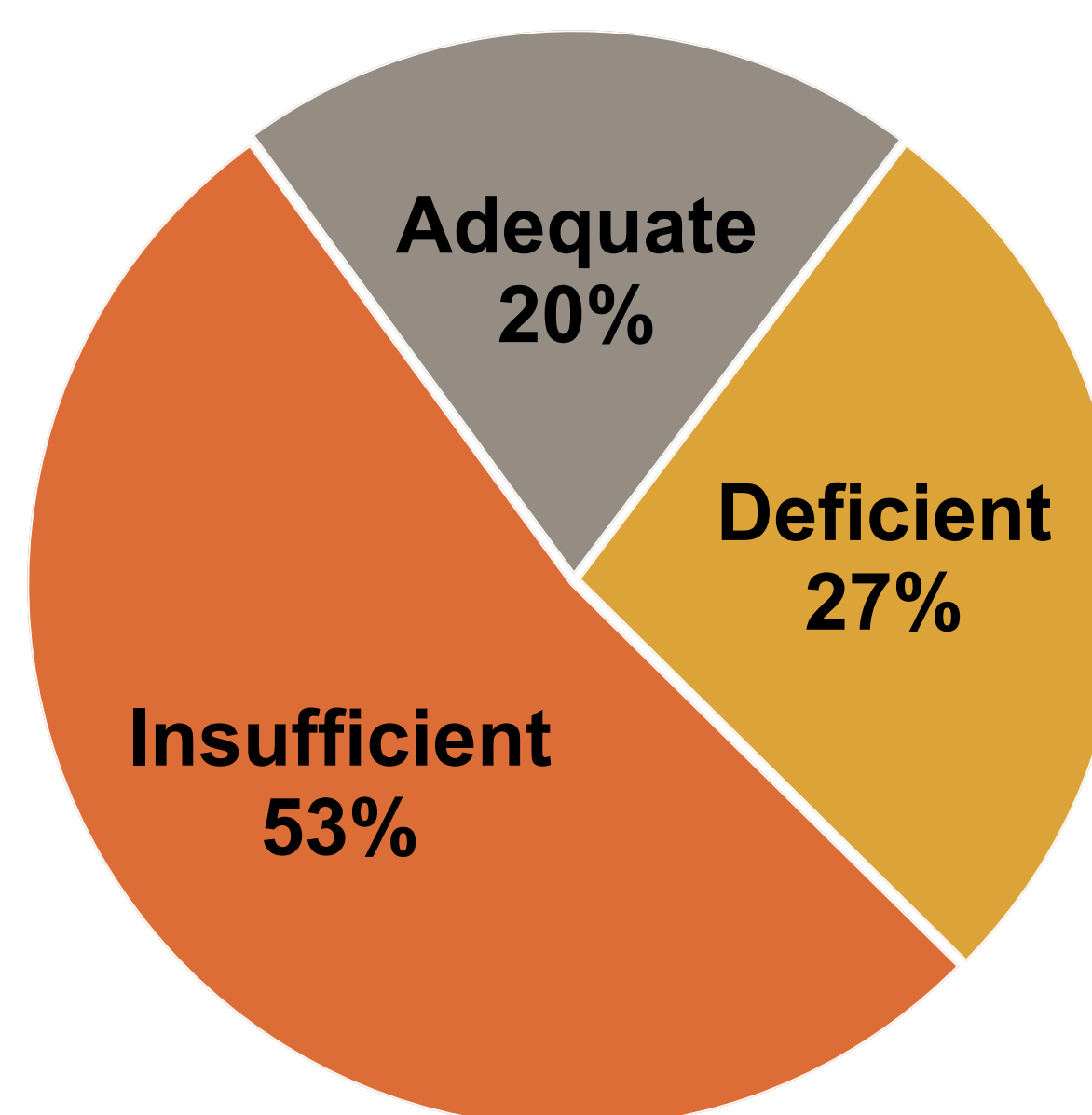


Figure 1. Vitamin D levels in patients tested on the ICU

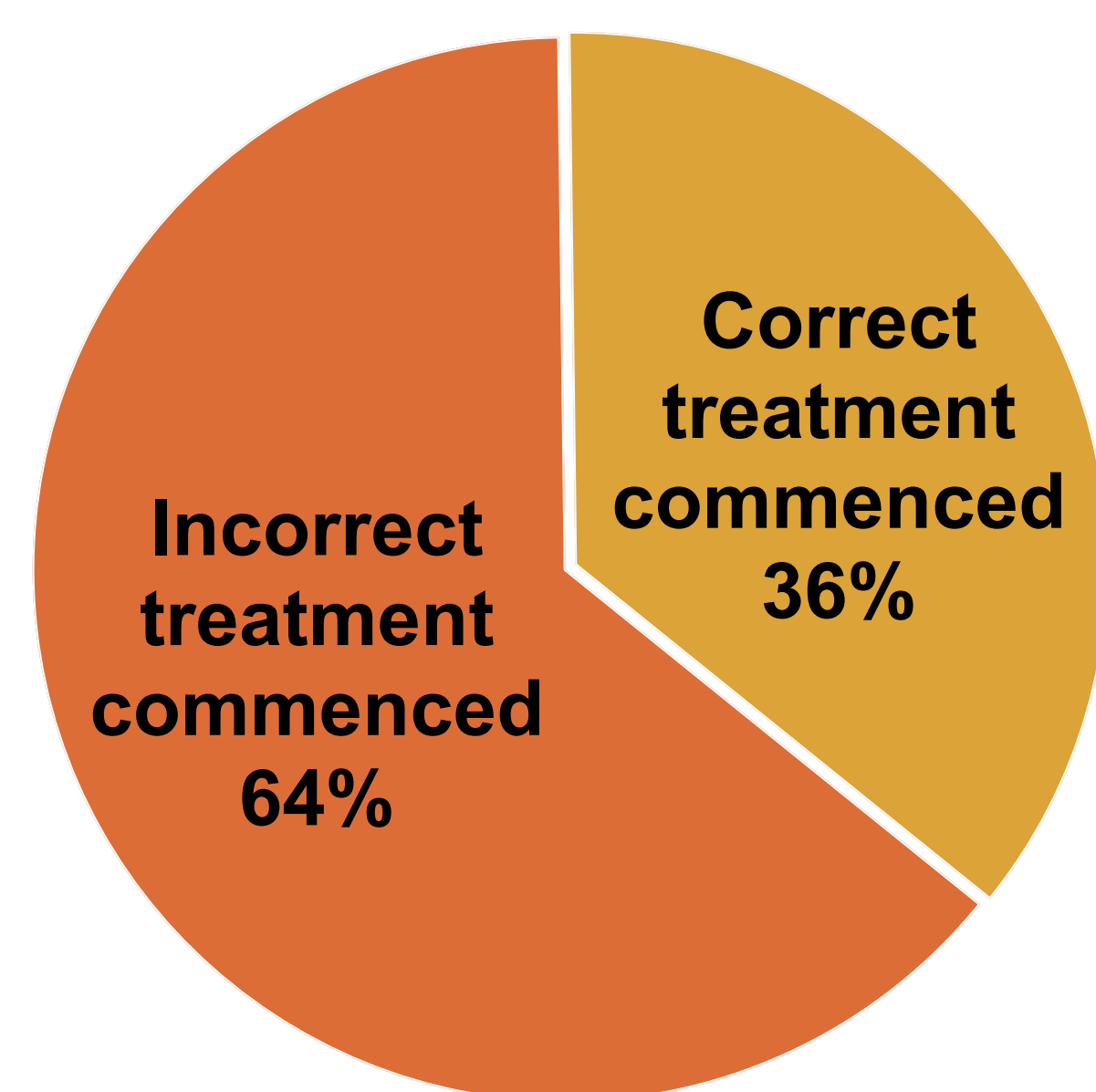


Figure 3. Overall proportion of correct treatment prescribed in the ICU for patients with Vitamin D deficiency or insufficiency

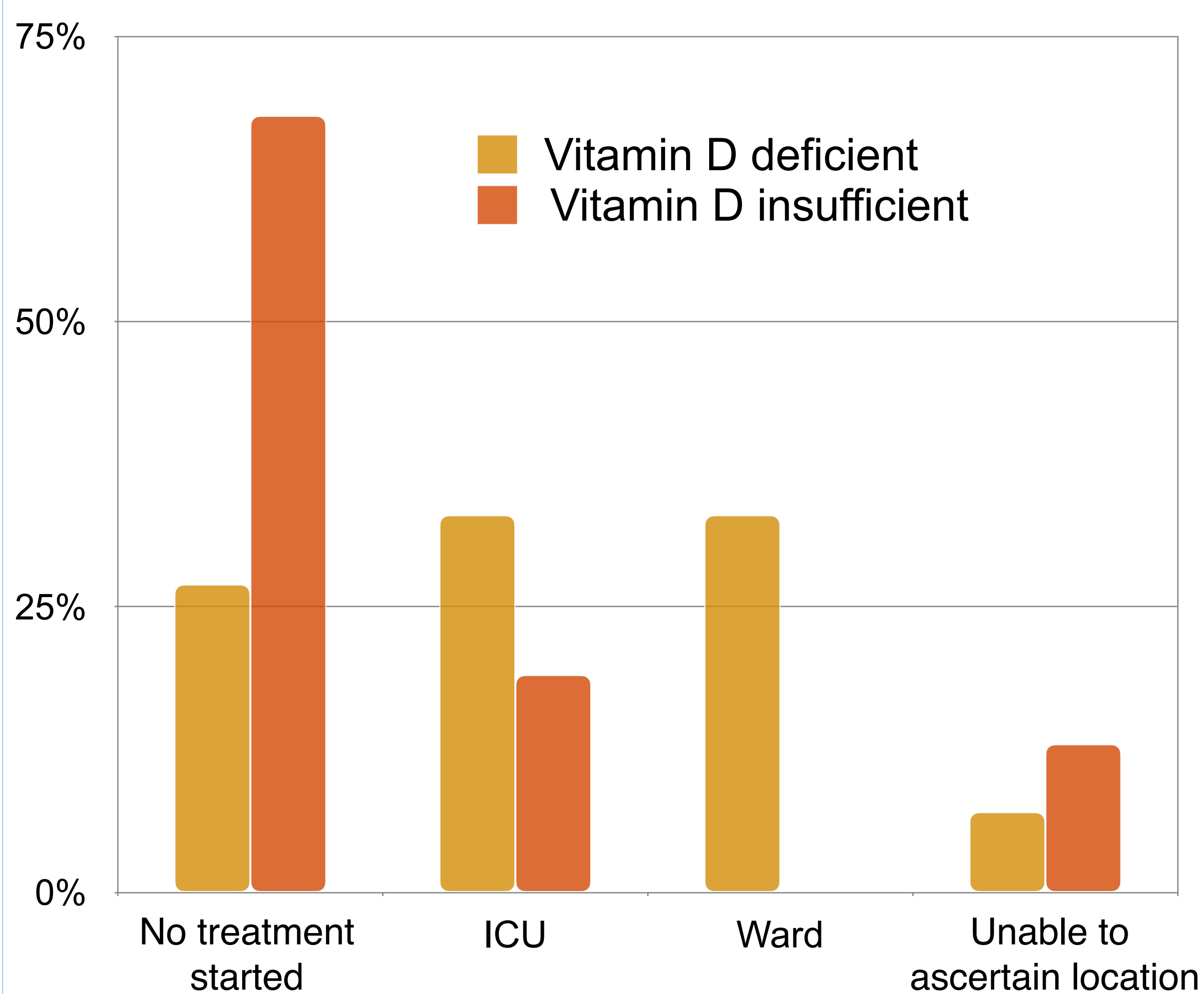


Figure 2. Commencement of treatment by location in Vitamin D deficient and insufficient patients

Conclusions

Our small review showed that in our critical care unit there was a wide variability of practice in the day of testing and treatment of both deficient and insufficient patients.

Our local guidelines use different cut off definitions as compared to the ESPEN guidelines; however both share similar principles. It is currently unclear who we should test, when we should test them and how we should treat those with deficiency or insufficiency.

The VITdAL-ICU trial showed in their secondary outcome that treated severe vitamin D deficiency had a lower hospital mortality and from this the VITDALIZE study was prompted. This trial is currently recruiting and hopefully will provide further evidence on vitamin D replacement in critically ill patients.

References:

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