

PHARMACOLOGICAL VITAMIN D SUBSTITUTION IS REQUIRED BEYOND STANDARD NUTRITION FORMULAS TO CORRECT HYPOVITAMINOSIS IN CRITICALLY ILL TRAUMA PATIENTS.



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BACKGROUND AND IMPORTANCE

Contribution of **clinical pharmacist in high standard clinical nutrition** is useful and rational. Beside personalized dosage of macronutrients, drug formulation and compatibility assessment, the tailored management of micronutrients requires specially trained pharmacists. Deficiency of vitamin D is common among severe injury victims admitted to intensive care unit and hypovitaminosis is associated to unfavourable outcome. However, the need and method of **targeted vitamin D supplementation** beside standard clinical nutrition interventions are not clear as high dose parenteral (im.) substitution may have disadvantages.

AIM AND OBJECTIVES

Aim of our study was to assess the effect of standard clinical nutrition interventions on vitamin D levels during long term clinical nutrition and to test a **clinical pharmacologist initiated** enteral supplementation formula to correct low vitamin D levels.

MATERIALS AND METHODS

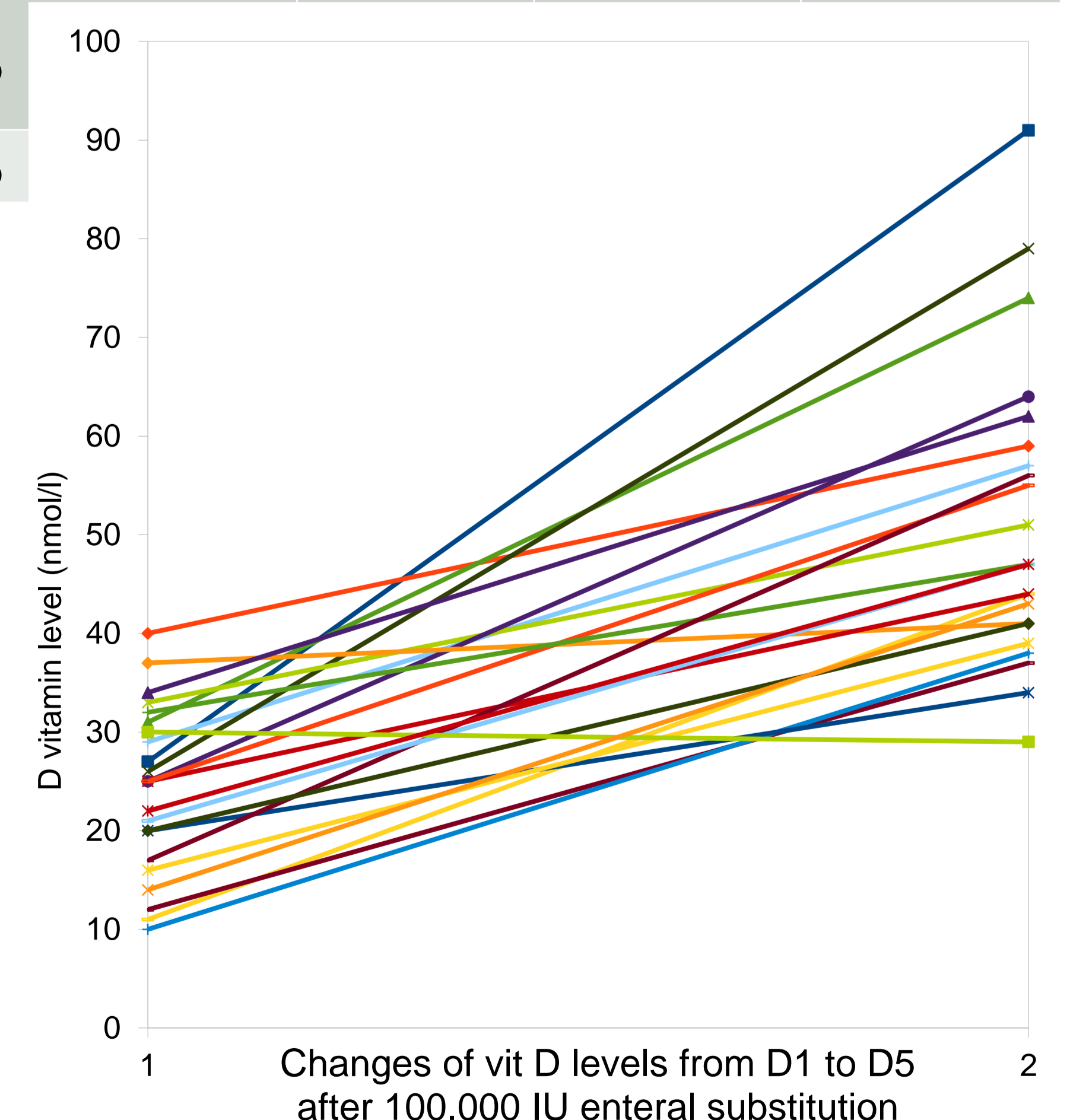
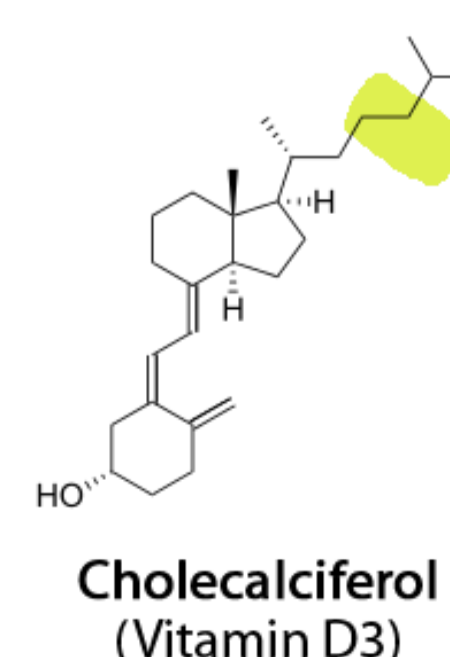
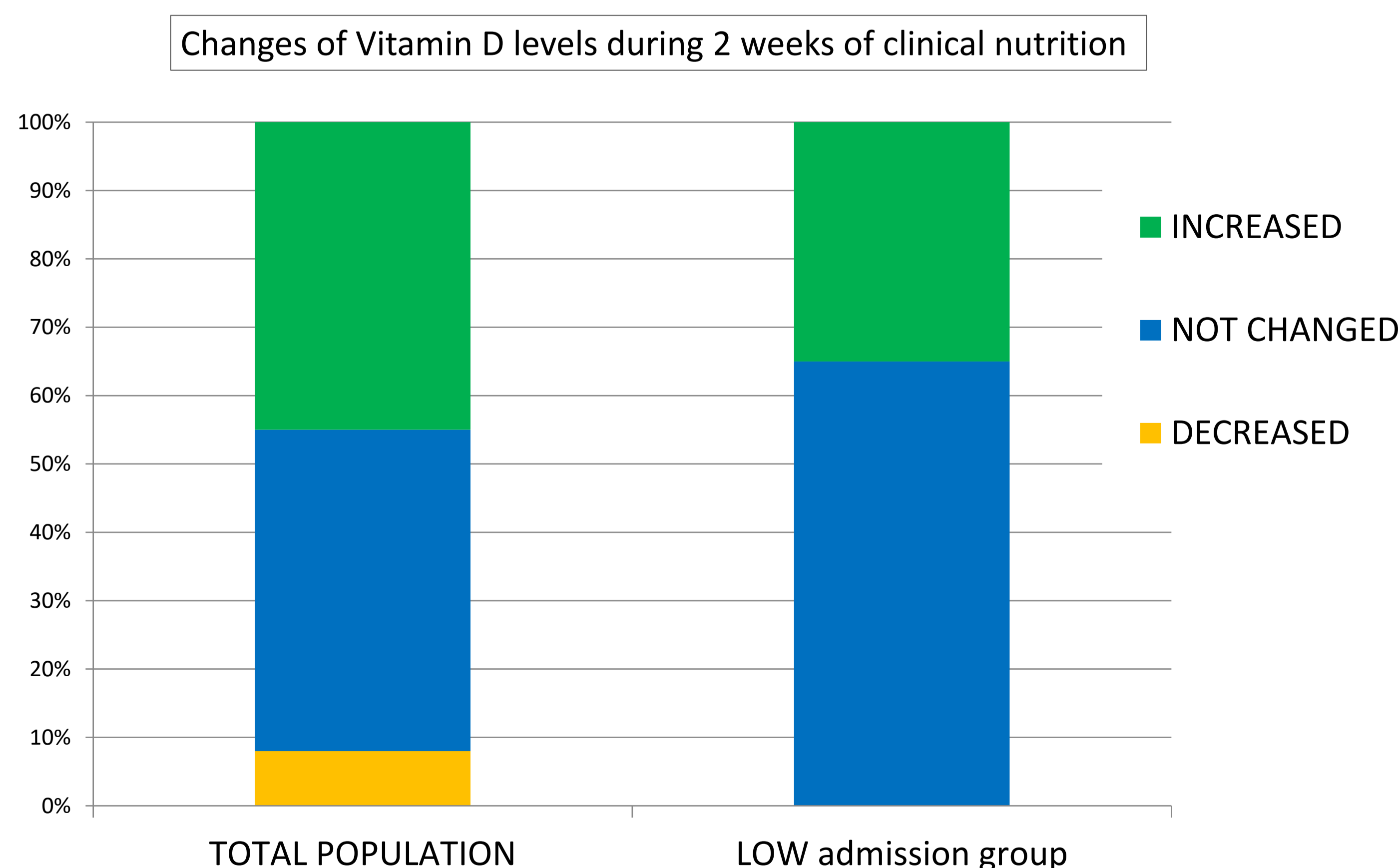
- Single centre, prospective, observational study.
- Adult, major trauma patients admitted to intensive care unit and requiring long term (>2 weeks) clinical nutrition.
- Demographic, clinical data, nutritional status (NRS-2002), method and length of clinical nutrition, outcome parameters.
- Standard, factory-based formulas were used (Fresubin 2kcalHP - enteral, Kabiven central - parenteral).
- Vitamin D level was measured by central lab (ABBOTT Immunoassay) at day 1,7,14,28.
- Vitamin D levels and supplementation strategy was evaluated by responsible clinician and clinical pharmacist.
- In a pilot, it was performed enterally by 100.000 international unit cholecalciferol (4x25.000 IU vitamin D3, Fresenius Kabi).
- Statistical analysis: Mann-Whitney test, chi-square test (p<0.05).

RESULTS

- 57 patients (84% men, median age 51, median BMI 26)
- Majority of them suffered major multiple trauma (median ISS: 25)
- Enteral nutrition was most frequent intervention (94%)
- Vitamin D deficiency (≤ 30 nmol/l) was detected in 39% of patients.
- Vitamin D level increased only in 45% of patients, but deficiency was corrected only in 35% of cases by standard nutrition care.
- In a subset of patients admitted with low vitamin D level (n=23) a single dose of enteral 100.000 unit cholecalciferol corrected the hypovitaminosis state in 22/23 patients within 5 days.

Population	n = 63
Age (year)	51 (16-81)
Male	84%
BMI	26,7 (18-36)
Co-morbidities	CV 41%, DM 8%, Alcohol 41%, Liver 14%, Renal 10%
Malnutrition (NRS>3)	33%
SAPS score	39 (10-69)
Trauma - Polytrauma	50%
- Traumatic Brain Injury	63%
ISS score	25 (9-57)
Ventilation	89%
Vasopressor treatment	73%
Infection/Sepsis	60%
LOS ICU (day)	13 (3-60)
Hospital mortality (30 days)	25%
Enteral	94%
Parenteral	38%
Peroral	38%

	Admission (n=63)	D7 (n=53)	D14 (n=41)	D28 (n=20)
Vitamin D level (nmol/l, min-max)	37 (33-102)	43 (38-120)	40 (35-118)	45 (33-145)
Patients under 30 nmol/l	44%	34%	27%	35%
Low Vit D - Summer	31%			
Low Vit D - Winter	61%			



CONCLUSIONS AND RELEVANCE

Vitamin D deficiency is common in trauma intensive care unit. Beside **standard clinical nutrition normal vitamin levels are maintained, but deficiencies are not corrected.** Vitamin D therapy might be required shortly in patients admitted with low vitamin D levels. **A patient tailored, nutrition synchronized, pharmacist initiated** intervention (e.g. single dose of enteral 100.000 IU cholecalciferol) seems to be efficient enough to normalize vitamin D levels in critically ill trauma patients.