IS LOW VITAMIN D LEVEL AN INFLAMMATORY MEDIATOR OF ANAEMIA IN KIDNEY TRANSPLANTATION?

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BACKGROUND

- Anaemia following kidney transplantation is common and multi-factorial, with a prevalence of 20-57%.
- Post-transplantation anaemia is associated with inferior patient- and graft- survival.
- Hepcidin prevents iron absorption and sequestration within the reticulo-endothelial system, thus inhibiting normal iron recycling for erythropoiesis.
- Raised hepcidin is associated with anaemia in kidney transplant recipients (KTRs).
- Systemic inflammation and reduced renal function are major determinants of raised hepcidin among KTRs.
- Vitamin D deficiency is associated with inflammation and raised hepcidin levels in chronic kidney disease, but its role in kidney transplantation remains undefined.

OBJECTIVES

- To determine the prevalence of vitamin D deficiency among clinically stable KTRs.
- To evaluate the impact of vitamin D on inflammation, hepcidin and Hb levels in clinically stable KTRs.

METHODS

- This single-centre cross-sectional study enrolled KTRs who were at least 1 year post-transplantation.
- Vitamin D deficiency was defined using the Kidney Disease Outcome Quality Initiative (KDOQI) guideline:

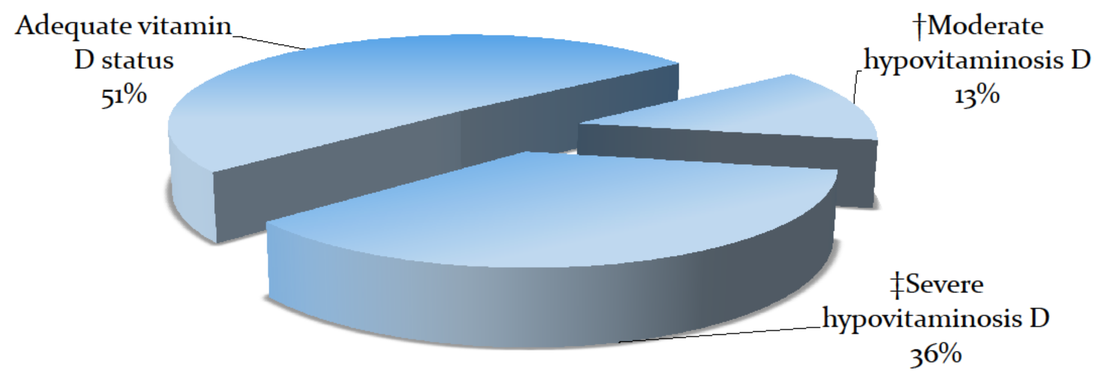
Classification of Vitamin D Deficiency	Concentration
Moderate deficiency	12-39 nmol/L
Severe deficiency	< 12 nmol/L

- Fasting serum samples were collected for measurements of:
  - 25-Hydroxyvitamin D (vitamin D)
  - Hepcidin-25 (Hepcidin)
  - High-sensitivity c-reactive protein (hsCRP)
  - Haemoglobin (Hb)
  - Ferritin (Ferr)
  - Transferrin saturation (TSAT)
  - Estimated glomerular filtration rate (eGFR)
- Fat tissue index (FTI) was measured using bio-impedance based body composition monitor.
- Demographic, nutritional and clinical predictors for Hb, hepcidin and inflammation (hsCRP) were assessed using univariate and multivariate regression analyses.

RESULTS

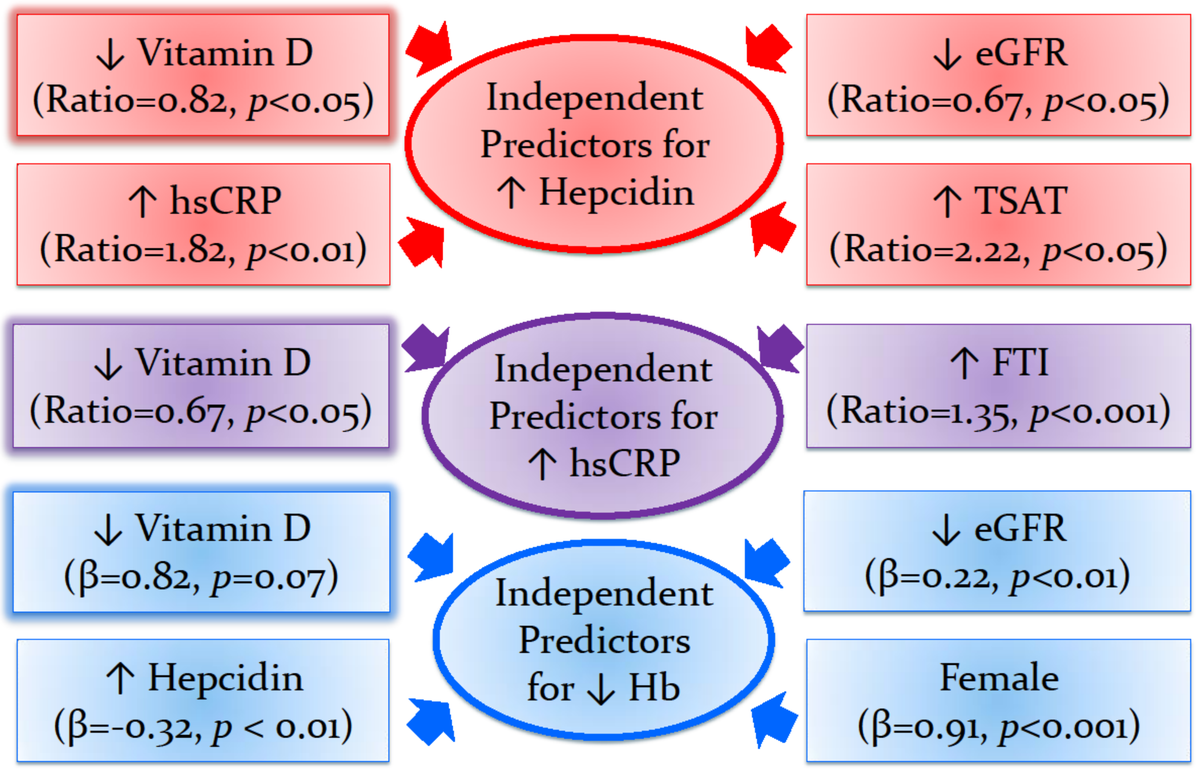
Population Characteristics	
Sample size	n = 100
Mean age	51 ± 14 years
Gender	54% male
Median time post-transplantation	4 (2-11) years
Median vitamin D	41 (20-64) nmol/L
Median hepcidin	43 (29-69) ng/mL
Mean Hb	12.2 (± 1.5) g/dL
Mean eGFR	44.1 (± 17.6) mL/min
Median hsCRP	2.47 (1.01-4.70) mg/L
Mean fat tissues index (FTI)	14.2 (± 6.2) kg/m²

Prevalence of Hypovitaminosis D Among Kidney Transplant Recipients



†Moderate deficiency: 25-hydroxyvitamin D concentration = 12-39 nmol/L
‡Severe deficiency: 25-hydroxyvitamin D concentration < 12 nmol/L

Multivariate Regression Analysis: Factors associated with Hb, hepcidin and hsCRP



CONCLUSION

- **Vitamin D deficiency is highly common among KTRs.**
- **Low vitamin D level is closely associated with raised hepcidin and inflammation.**
- **This study sets the scene for future research and therapeutic strategies against anaemia among KTRs.**

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