

# EVALUATION OF TWO ROUTINELY USED 25OHD ASSAYS AND SERUM VARIABLES IN PATIENTS ON DIALYSES

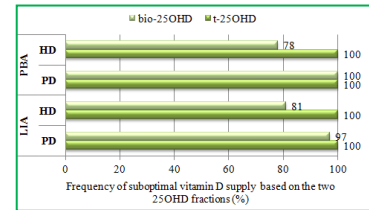
Z. Lőcsei<sup>1</sup>, L. Kovács<sup>1</sup>, D. Balogh<sup>5</sup>, A. Szijártó<sup>5</sup> and B. Kálmán<sup>2</sup>, G.L. Kovács<sup>4,5</sup>, E. Toldy<sup>3,5</sup>

<sup>1</sup>st Department of Medicine<sup>1</sup>, Center for Molecular Medicine<sup>2</sup>, Central Laboratory<sup>3</sup> Markusovszky Teaching Hospital of County Vas, Szombathely and Institute of Laboratory Medicine<sup>4</sup>, Institute of Diagnostics<sup>5</sup>, University of Pécs, Hungary

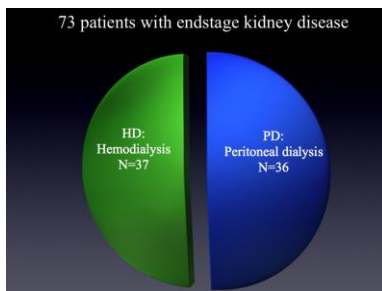
## Background

The total **25-hydroxy-vitamin-D (t-25OHD)** level can be routinely assessed by various methods and reflects vitamin D intake. Results are influenced by the serum variables affected by dialyses.

**Aims:** to examine t-25OHD and **bioavailable vitamin D (bio-25OHD)** by two most frequently used methods in patients on peritoneal- (PD) and hemodialysis (HD).

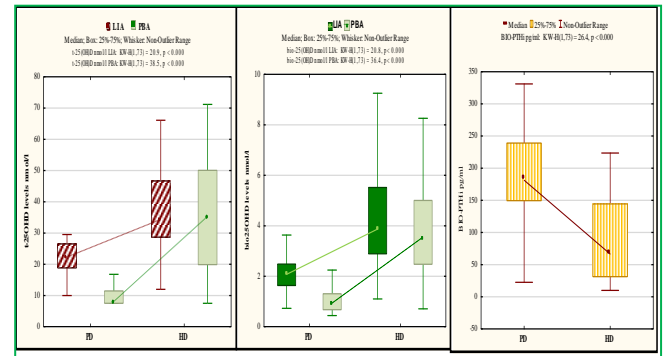


## Investigated cases

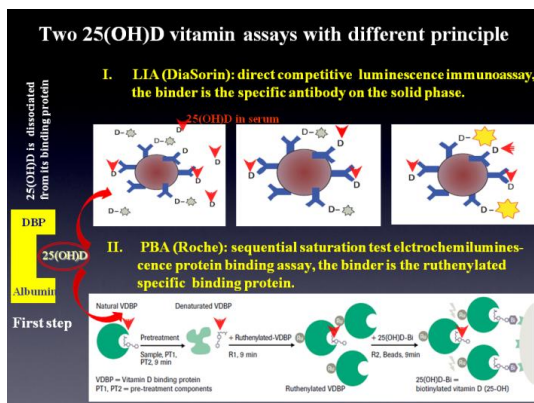


We studied 37 HD (64±15 years, 17 females, 20 males) and 36 PD (63±18 years, 15 females, 21 males) patients without vitamin D substitution.

All investigated cases had suboptimal vitamin D supply by both t-25OHD assays. However, the frequency of suboptimal supply decreased on the bases of bio-25OHD levels especially in HD.



## Methods



All 73 sera were analyzed for **t-25OHD** by two assays with different principles.

In addition the following biomolecules were measured: **PTH-biointact (Bio-PTHi)** by immunometric assay (ECLMA, Roche), **vitamin D binding protein (DBP)** by turbidimetry (Dako), and **total protein (TP)**, **albumin (Alb)** and **calcium (Ca)** by colorimetry (Roche, Modular).

The **bio-25OHD** values were calculated (Vermeulen et al. 1999, Bhan et. al. 2012) The cutoff values for evaluation of Vitamin D supply or t-25OHD and bio-25OHD are summarized in the table.

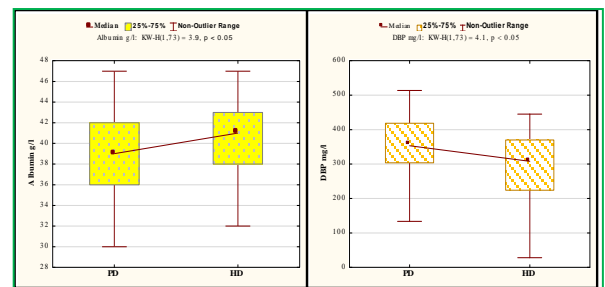
25OHD fractions	Optimal (nmol/L)	
	LIA	PBA
t-25OHD	>75	>75
bio-25OHD	>6.1*	>6.4*

\* calculated from 64 healthy volunteers with >75 nmol/l t-25OHD, at 2.5 percentile.

## Results

The frequency of undetectable t-25OHD level was higher by PBA (29%) than by LIA (1.4%).

Values of t- and bio-25OHD were significantly lower in PD than in HD, while Bio-PTHi levels were significantly lower in HD than in PD.



Albumin levels were lower in PD than in HD, but DBP levels were higher in PD than in HD ( $p < 0.05$ ).

**Positive correlations** were observed with both methods between t-25OHD and albumin levels in PD only (PBA:  $r = 0.36$ ;  $p < 0.05$ ; LIA:  $r = 0.48$ ;  $p < 0.01$ ).

**Negative correlations** were observed between Bio-PTHi and t-25OHD levels (PBA:  $r = -0.39$ , LIA:  $r = -0.42$ ;  $p < 0.05$ ) **in HD only**; **negative correlations** observed between Bio-PTHi and bio-25OHD were similar in both HD and PD (LIA: PD  $r = -0.40$ , HD  $r = -0.54$ ,  $p < 0.01$ ; PBA: PD  $r = -0.49$ , HD  $r = -0.44$ ).

The correlations of t-25OHD levels assessed by LIA and PBA were different (HD:  $r = 0.89$ ;  $p < 0.001$ ; PD:  $r = 0.47$ ,  $p < 0.01$ ), but correlations of bio-25OHD values were similar in both groups (HD:  $r = 0.85$ ; PD:  $r = 0.83$ ,  $p < 0.001$ ).

## Conclusions

- Assessment of vitamin D supply by LIA and PBA is influenced by lower albumin levels especially in PD.
- Estimation of bio-25OHD is more suitable in PD, while t-25OHD is a reliable measure with either method in HD.