

INTRAVASCULAR BLOOD VOLUME ANALYSIS AND NORMALIZED HEMATOCRIT MAY IMPROVE VOLUME AND ANEMIA OPTIMIZATION IN CKD

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Anemia evaluation is inextricably linked to volume status. We hypothesize that Blood Volume Analysis (BVA) and normalized hematocrit (nHct) will improve intravascular (plasma, RBC) volume assessment leading to a more accurate anemia assessment.

Methods: Included were 5 patients (pts) (60-86 yrs) classified as non-anemic (Hgb 10-12g/dl) at steady state, following ultrafiltration (UF) with hemodialysis or peritoneal dialysis. Pts who were not considered anemic and those with iodine allergy were excluded. Tagged tracer dilution intravascular BVA measurement was performed by an independent blinded physician providing plasma volume (PV) Total Blood Volume (TBV), RBC volume (RBCV) and nHct. BVA data classified pts (normo-, hypo- and hypervolemic) based upon +/- 8% deviation from ideal TBV.

Results: BVA data (Table 1) showed 2/5 pts (pt 4, pt 5) were anemic (low nHct) and hypovolemic (low TBV); Pts 2-5 were RBC depleted. Pt 5 was severely volume depleted (low: TBV, RBC, PV).

Table1. Blood Volume Data

Patient ID n=5	Age (yrs)/sex	% Dev from ITBV (Normal±8%)	% Dev from IRBCV(Normal±10%)	% Dev from IPV(Normal±8%)	pHct (Normal 30-36)	nHct %	BVA Evaluation
1	60/F	-0.7	-10.7	4.9	36.0	35.7	Normovolemic
2	83/M	-5.0	-29.5	11.7	33.4	31.7	Normovolemic
3	86/M	+5.7	-28.9	29.2	30.0	32.0	Normovolemic
4	77/M	-9.6	-35.7	8.2	32.0	28.9	Hypovolemic
5	66/F	-31.1	-45.6	-23.0	31.6	21.8	Hypovolemic

I=Ideal; Dev=Deviation

Conclusions: 1) Volume assessment requires objective measurements, 2) nHct distinguished true anemia from hemodilution, 3) BVA and nHct may provide objective assessment of BV, distinguishing RBC and/or plasma deficit/excess leading to improved volume (UF, diuresis, plasma, RBC) and anemia management.