



Blood Volume Analysis (BVA) Clinical Case Study

Hypertension Due To Expanded Plasma Volume

History:

This 70 year old, 72" height, 238lbs. Caucasian male has a history of hypertension. He is scheduled to have prostate surgery involving transurethral prostatectomy. Patient has a borderline low hematocrit of 37%. Patient is currently on Tenormin (β -blocker) for hypertension. Blood pressure is 150-160/88-95. Patient referred to determine volume status prior to surgery and to evaluate hypertension therapy.

BVA Results:

Blood Vol.	7260cc	Ideal Blood Vol.	5878cc	Excess	1381cc	Devtn.	23.5%
Red Cell Vol.	2502cc	Ideal Red Cell Vol.	2383cc	Excess	118cc	Devtn.	5.0%
Plasma Vol.	4758cc	Ideal Plasma Vol.	3495cc	Excess	1263cc	Devtn.	36.1%

Normal
0 to 8%

Mild
8 to 16%

Moderate
16 to 24%

Severe
24 to 32%

Extreme
>32%

Hematocrit: 37%

Clinical Findings:

This patient is severely hypervolemic. The hypervolemia is caused entirely by expansion of blood volume. This patient's hypertension is primarily due to the salt, fluid retention type. Patient should be treated with diuretic therapy. Such therapy should be started after surgery after he is stabilized. His hypervolemia is not a contraindication for surgery and may be beneficial. In effect this patient has hemodiluted himself prior to surgery by volume expansion. The patient's red cell mass is normal and his hematocrit would be 45% if his plasma were normalized. It is recommended that antihypertensive medication be discontinued at least 48 hours prior to surgery.

Technical Analysis:

Technical analysis consists of an evaluation of five separate blood volume collection points with mathematical evaluation of consistency. Technical evaluation is reported as acceptable or unacceptable.

All five individual sampling points, tested in duplicate, were internally consistent with no significant deviations. The standard deviation was 1.2243%. The slope was 0.00127 and is normal. Therefore, the results are technically acceptable.