

WOULD THE BLOOD VOLUME ANALYZER (BVA-100) BE AN ALTERNATIVE TO PULMONARY ARTERY CATHETER (PAC) IN CRITICALLY ILL PATIENTS**Sadir Alrawi MD, Leonidas Miranda MD, Ramanathan Raju MD Walter Cholewczynski MD, Anthony J Acinapura MD, Joseph N Cunningham MD**

Background: Measurement of urine output, mean arterial pressure (MAP), heart rate (HR), pulmonary wedge pressure (PWP) and cardiac index (CI) reflects the status of central blood volume including heart, brain, and lungs but do not reflect the status of peripheral blood. The accurate measurement of total blood volume provided by certain *noninvasive* techniques compared to “*guesstimate*” given by hematocrit reading or by PAC with all its possible complications could be the difference between life and death. The standard tests, hemoglobin and hematocrit do not provide an accurate measure of blood volume in sudden acute blood loss situations. **Material and method:** Twenty-five critically ill patients in the intensive care unit (ICU, surgical & medical) with PAC and fourteen normal persons (control) were evaluated after IRB approval for total blood volume measurement (BVM) by BVA-100. The instrument is used in conjunction with a specially patented syringe, which delivers a precise, quantitative injection of Albumin I-131 isotope into the patient; six consecutive blood samples were drawn for BV evaluation. All ICU patients were classified according to the APACHE II severity of disease classification system, PAC parameters were considered and fluid balance, ventilatory settings, vasopressors and treatment were evaluated. Serum lactate, arterial blood gas and mixed venous blood gas were determined. All these parameters were correlated with total blood, red cell and plasma volume. **Results:** We find no significant correlation between blood volume (BV), pulmonary capillary wedge pressure (PCWP) and central venous pressure (CVP) readings. There is also no correlation between (BV) and the other variables in the study including base excess from arterial blood gas, mixed venous blood gas saturation, cardiac output, cardiac index, systemic vascular resistance, serum lactate and oxygen deliver (A-VO₂). **Conclusion:** Clinical decision making in the management of critically ill patients regarding blood volume status should be measured by direct blood volume analysis, rather than by the indirect parameters of PCWP and CVP. However, serial BV measurements upon those patients toward end of resuscitation showed better patient compliance than single measurement or PAC catheter parameters.

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