ABSTRACT

Implantable left ventricular assist devices (LVAD) have dramatically changed the face of mechanical circulatory support of patients with advanced heart failure. With increased durability, reliability and safety these devices have extended the horizon of functional improvement, life quality and survival. Beyond crucial pre-operative and intra-operative issues, several device-host interface issues are important for successful outcomes. Among these are clear understanding of intravascular volume status, red blood cell volume status and early, often subclinical inflammation. Blood volume analysis (BVA) is a rapid blood test that measures these 3 metrics with rapid personalized and actionable results. We used BVA to evaluate 24 consecutive stable ambulatory patients supported with LVAD.

RESULTS

Twenty-four patients, who had undergone LVAD insertion for advanced heart failure at Baptist Heart Institute, Memphis, TN were re-evaluated from 46 to 1460 days following LVAD implantation. The patients were aged 35-72 years. From a clinical perspective and from LVAD device monitoring there was no awareness or suspicion of significant alterations in intravascular volumes, or significant anemia or polycythemia. BVA results were obtained in all patients studied. Data collected at the time of BVA included age, gender, body mass index, type of LVAD, intention of implant, and results of blood volume analysis.

CONCLUSIONS

BVA and its individualized, unique metrics is a valuable test when used in patients with LVAD’s. Despite improved functional status and adequate device performance wide variations are still present in patients being supported with LVAD’s. Additionally, measurement of red blood cell volume is helpful in determined variations (anemia or polycythemia) that might not be noted clinically and might presage future hemolytic and/or thrombotic events despite adequate anticoagulation.

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Value of Blood Volume Analysis in Patients with Left Ventricular Assist Devices

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