

**TITLE:** RIGHT AND LEFT ARM BLOOD PRESSURE DISCREPANCIES IN VASCULAR SURGERY PATIENTS

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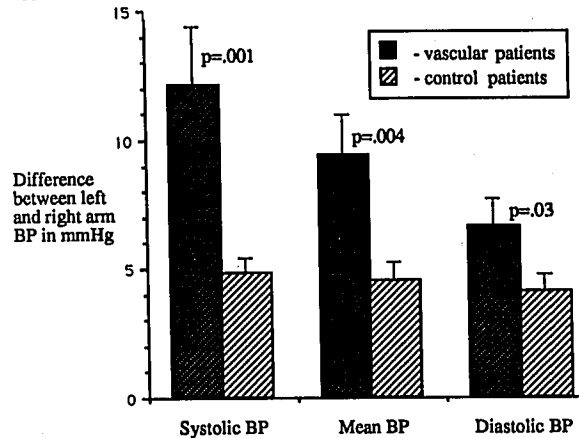
Blood pressure (BP) measurements are often taken in one arm alone and are misleading if there is a significant difference between the left and right arms. The patient may be falsely diagnosed as being hypotensive when the measurement is taken in the arm with the lower BP. In the intraoperative or ICU setting this may lead to the inappropriate use of vasopressor or inotropic therapy, which could then increase the incidence of myocardial ischemia or infarction in patients at risk. We compared patients with peripheral vascular disease (PVD) with a group of control patients without vascular disease with regard to left and right arm BP discrepancies.

BPs were obtained in 32 patients admitted for vascular surgery (carotid, aortic, and femoral-popliteal) and in 37 patients of similar age without vascular disease. Informed consent was obtained from all patients and the protocol approved by the Clinical Research Committee. The measurements were made using an automated oscillometric technique (Critikon, Dinamap, Tampa, Florida). The average of three BPs taken in each arm in awake patients was used for comparison. The differences between left and right arm BP were analyzed using an unpaired two-tailed T-test for continuous and the Chi-squared test for non-continuous variables. Significance was defined as  $p < 0.05$ .

The results are shown in the figure and table below. The data are shown as mean  $\pm$  SEM.

The data show that patients with PVD have a greater difference between left and right arm BP than patients without vascular disease. Almost 20% of patients with PVD had systolic BP differences of greater than 20 mmHg; a discrepancy of clinical significance. Because patients with PVD have a high incidence of coronary disease it is important to accurately monitor their hemodynamic parameters. The measured BP should be as close as possible to the true arterial BP which would most likely be the BP in the arm with the

higher reading. Further study is needed to determine whether the high or low arm most closely correlates with the central aortic BP. The authors believe that the recognition of patients with left and right arm differences in BP may reduce morbidity and mortality in some patients and recommend the careful evaluation of BP in both arms in patients with PVD. Supported by NIH grant # GM38177.



	vascular	control	p
# of patients with systolic BP right-left arm discrepancy > 10 mmHg	13/32 (41%)	5/37 (14%)	.02
# of patients with systolic BP right-left arm discrepancy > 15 mmHg	8/32 (25%)	0/37 (0%)	.001
# of patients with systolic BP right-left arm discrepancy > 20 mmHg	6/32 (19%)	0/37 (0%)	.008

## A106

**TITLE:** EFFECT OF ELECTIVE CARDIOPULMONARY BYPASS (CPB) SURGERY AND HEMODILUTION ON SERUM ERYTHROPOIETIN LEVELS AND ERYTHROPOIESIS

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The risks of blood transfusion to patients and OR personnel require exploration of new strategies, such as the use of recombinant human erythropoietin (r-HuEPO) in the perioperative period. In order to assess which patients might benefit from r-HuEPO we tested the following hypotheses: 1. Cardiac surgery (CS) with CPB retards the erythropoietic (EP) response to changes in EPO levels; 2. Patients who are anemic prior to surgery behave differently in their endogenous EPO response to the stress of CPB than non-anemic patients. We studied 34 patients undergoing elective CPB surgery with informed consent and approval of the institutional review board. We measured serum immuno-reactive EPO levels (normal: 4-26 mU/ml) by the method of Egrie<sup>1</sup> prior to anes. induction and on the days following surgery. Reticulocytes were counted and corrected for hematocrit. An HCT of 35% was prospectively chosen as a breakpoint. Group I (n=12) consisted of twelve non-anemic patients (hct > 35); Group II (n=22) consisted of 22 anemic patients (hct < 35). Statistical analysis was by ANOVA and paired t-test.

Data reported as mean  $\pm$  SD. The mean hematocrit for Group I was 40.8  $\pm$  3.08%, and for Group II was 33.2  $\pm$  1.9%. In Group II, preop measurement of serum iron, iron binding capacity, vitamin B12, folate, ferritin, reticulocyte counts and sternal bone marrow biopsy (at sternotomy) were normal. In Group I, serum EPO concentrations rose from baseline 13  $\pm$  4.3 mU/mL to 100  $\pm$  84 mU/mL on the day after surgery and remained elevated at postop day 5 (47  $\pm$  27 mU/mL). Despite these elevations, reticulocytes were unchanged from baseline at postop days 1 through 5. Anemic (II) patients had no elevation of preop EPO above normal levels, and postop their EPO response was significantly blunted when compared to Group I.

CS raised EPO by a factor of 7.6 and levels remained elevated for at least 5 days in Group I, but the data suggests that EP response to elevated EPO (reticulocytosis) may be impaired. Data beyond postop day #5 is necessary to clarify this point. Group II patients had no elevation EPO levels, no common causes of anemia, and normal marrow histology despite normochromic, normocytic anemia—consistent with "anemia of chronic disease"; not surprising considering physical status (NYHA Class III or IV). It is interesting, however, that the EPO response to CPB is compromised when compared to Group I.

We conclude that perioperative therapy with r-HuEPO might be useful in CS patients, especially when HCT < 35. A controlled double-blind study is underway to address this possibility.

**References:**

1. J Immunol Methods 99:235-241, 1987.