

Relationship between Arterial Stiffness and Functional Capacity in Kidney Transplant Patients

Alexandra Kastelz^{ab}, Ivo G. Tzvetanov^a, Rebecca Kappus^b, Garrett Griffith^b, Alexander Rosenberg^b, Bo Fernhall^b, Lorenzo Gallon^c, Aneesha Shetty^c, Enrico Benedetti^a

^a Department of Surgery, College of Medicine, University of Illinois University at Chicago, Chicago, IL, USA. ^b Integrative Physiology Laboratory, College of Applied Health Sciences, University of Illinois at Chicago, IL, USA. ^c Department of Nephrology, Northwestern Medicine, Chicago, IL, USA.

Introduction: While survival rates are much greater in kidney transplant (KT) than in dialysis patients, significant issues remain. Elevated pulse pressure (PP), carotid beta stiffness, and central pulse wave velocity (cPWV) have all been shown to be associated with cardiovascular disease, which is the main cause of death in kidney transplant patients. **Purpose:** To evaluate the relationship between physical activity levels, functional-capacity and arterial health in KT patients. **Methods:** Thirty-six persons with KT (means ± SE: 44 ± 2.23 yrs , 97.51 ± 5.096 kg, 18 males) that were 2-18 months post-transplant had measures of arterial stiffness performed (PP, carotid beta stiffness, and cPWV) in addition to functional-capacity via 6 minute walk test (6MWT) and a 1-week free living physical activity assessment via accelerometry. Results were analyzed using bivariate correlations. Statistical significance was set at p< 0.05. **Results:** Both aortic and brachial PP as well as carotid beta stiffness were negatively correlated with 6MWT distance (r= -0.353, P=0.037; r= -0.341, P= 0.042; r= -0.336, P=0.045) however central cPWV was not (r= 0.10, P=0.962). 6MWT distance was negatively correlated with percent time spent in sedentary behavior (r = -0.398, P=0.044) and positively correlated with percent time spent in light physical-activity (r= 0.424, P=0.031). Percent time in sedentary, light, and moderate activity were not correlated with PP, carotid beta stiffness, or cPWV. **Conclusions:** These findings suggest lower functional-capacity is associated with higher aortic and brachial PP and carotid beta stiffness in persons with KT. The lack of significance between cPWV and 6MWT distance may suggest a lack in correlation between functional capacity and central aortic stiffness or the possibility KT somehow alters cPWV. Further research is required to investigate this. Additionally, these findings suggest greater daily physical-activity may improve functional-capacity but may not affect arterial stiffness in these patients.

Supported by Gift of Hope and the University of Illinois at Chicago Surgery Department

r=Pearson Correlation

	Aortic PP	Beta Stiffness	Central PWV
Percent Sedentary	r= 0.082, P= 0.691	r= -0.005, P= 0.980	r= 0.140, P= 0.555
Percent Light	r=-0.083, P=0.687	r= -0.184, P=0.369	r= 0.074, P=0.757
Percent Moderate	r= -0.223, P= 0.274	r=-0.135, P=0.511	r= -0.017; P=0.944