FIBEROPTIC ANGIOSCOPY: A METHOD FOR QUANTIFICATION OF INTRAVASCULAR THROMBOSIS.

Christopher C. Johnson, M.D., James L. Ritchie, M.D., F.A.C.C., John R. Stratton, M.D., F.A.C.C., Dennis D. Fleichenhein, M.D., University of Washington and VA Medical Center, Seattle, WA.

Application of thrombolytic therapies necessitates improved methods for detection and quantification of intravascular thrombi. Angioscopically determined thrombosis was compared to platelet deposition and quantified by "indium platelet labeling. After platelet labeling and thrombus induction using over-sized PTCA balloons, porcine carotid arteries (n=12) were imaged every 0.3 centimeters (cm) by fiberoptic angiography. Arteries were sectioned post-mortem and well counted. Thrombus deposition by angiography was quantified by digitized measurement of percent luminal area occluded by thrombus. Overall correlation between angiographic thrombus deposition and platelets per cm of artery was excellent (r=0.83, p<.001). Injured arteries without angioscopically visible thrombus had 8.3x10^6/ptlnear cm (L/cm) of artery. By comparison, an uninjured vessel had 1.7x10^6/ptL/cm (p<.01), while 100% occlusion by angiography predicted 2.6x10^6/ptL/cm.

We conclude that angiography can provide a useful semiquantitative measurement of intravascular thrombosis. Balloon injury without intraluminal thrombus is associated with a five-fold increase in platelet deposition within the vessel wall, not detectable by angiography.

ALPHA-VASCULAR ACTIN MESSAGING IS INCREASED IN SPONTANEOUSLY HYPERTENSIVE RATS.

Roth J. Stoka, M.D., Kelly M. Crawford, B.S., Alvin S. Blaustein, M.D., James L. Leonard, Ph.D., University of Cincinnati Medical Center, Cincinnati, OH.

Spontaneously hypertensive rats (SHR) constitute a genetic model of hypertension. Since SHR aortas have increased medial thickness, we hypothesized that levels of messenger RNA (mRNA) encoding the a-vascular smooth muscle actin would be increased. We measured systolic BP (tail cuff) in 6 SHR and 6 age-matched control Wistar-Kyoto (WKY) rats. BP in the SHR group was significantly elevated (174±16 vs. 96±4 mmHg; mean±SEM; p<.005).

Total cellular RNA was isolated from thoracic aortas and hearts for Northern blot analysis. The Northern blots were then probed with a labeled oligonucleotide derived from rat a-vascular actin DNA, which hybridizes only with mRNA encoding a-vascular actin. To measure total actin mRNA we used a second probe which identifies mRNA containing coding sequences common to all actin isoforms. Autoradiography and computerized densitometry were used to compare SHR and WKY muscle actin mRNA levels.

We found more total muscle actin mRNA in both SHR aortas and hearts compared to WKY. SHR aortas contained 1.8 times more total muscle actin message and 4.4 times more a-vascular mRNA than WKY aortae. The increased a-vascular mRNA presumably accounts for the elevation in total muscle actin message. It remains to be determined whether these higher mRNA levels result in increased a-vascular actin content. Likewise, it is unclear if such changes in SHR aortas produce elevated vascular resistance, or whether they are the result of the increased mechanical stress of hypertension.