CAPILLARY PATHLENGTH AND FLOW HINDRANCE IN NOROMOTENSIVE (WKY) AND HYPERTENSIVE (SHR) RATS. Y-C. Cha and H.N. Mayrovitz, Miami Heart Institute, Miami Beach, FL 33140

Though significant arteriolar changes accompanying hypertension are well documented, little is known about the detailed changes in capillary network features which may occur. The flow path length (L) and the flow hindrance (H) offered by each capillary pathway are fundamental network parameters which importantly effect microcirculatory function. To determine if differences in these parameters are associated with the hypertensive process we measured L in the cremaster of 7 WKY and 7 SHR (6-7 wk) via detailed in vivo observations after rendering the microvasculature fluorescent with intravenous administration of Fluorescein Isothiocyanate-Dextran 150 (30 μg/g). From measurements of diameter (Di) and length (Li) of each path's segments, H was calculated as the sum of Li/Di for each pathway. Total segments measured were, 934 in WKY and 604 in SHR corresponding to 204 and 146 pathlengths respectively. Groups (WKY vs SHR) differed in mean blood pressure (97.7 vs 144.2 mmHg, P<0.001, t-test) but no difference in L was found (406 ± 12 vs 460 ± 16 μm, mean ± SEM). H was significantly greater in WKY (0.489 ± 0.004 vs 0.341 ± 0.003 μm²). Since no group differences in Li were found (108.0 ± 3.6 vs 128.5 ± 5.8 μm), the greater hindrance per capillary pathway is primarily due to a smaller mean Di found in WKY (6.07 ± 0.07 vs 6.46 ± 0.11 μm, P<0.001).

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