42) Studies on Aortic Damage in SHR SP — Estimation of Arterial Architecture by Major Component Analysis —

Takayama Y*, Fukunaga Y, Abe N, Takeuchi K, Saito M, Arai C,
and Hasegawa M**, Komazawa T***, Ito H, and Okamoto K****

Department of Medical Engineering, Toho University*,
Laboratory of Clinical Physiology, Faculty of Medicine,
Toho University**, Institute of Mathematics***,
Department of Pathology, Kinki University School of Medicine****

Six components for the arterial architecture of WKY and SHR SP were determined histochemically and arterial lesions in SHR SP was overall assessed with major component analysis. Materials consisted of a total of 89 samples (18 samples from WKY and 71 samples from SHR SP), ranging from 50- to 600-day of age. Smooth muscle cells (SMC) obtained from tunica media of thoracic aorta, nuclear DNA, elastin (EL), collagen (CL), acid mucopolysaccharides (AMPS), and glyco-protein (GP) were determined with MSP method and subjected to major component analysis, which revealed that high factorial loading was found in EL -0.82, GP 0.76, and age 0.66 in the 1st major component, DNA 0.82 of the 2nd major component, and AMPS 0.72 of the 3rd major component. The cumulative contribution ratio from the 1st to 3rd major components showed a high value of 71.2 %. The changes in the 6 components were analyzed by plotting the individual sample values on the graph consisting of abscissa with the 1st major component and ordinate with the 2nd major component and by dividing the resultant concentrated ellipses of these points into four groups. It was shown that the arterial lesion resulted in the decrease in EL, CL, and AMPS, in contrast to the increase in DNA, SMC, and GP.