ULTRASONIC TEXTURAL CHANGES OF CAROTID INTIMA-MEDIA COMPLEX IN PATIENTS AFTER KAWASAKI DISEASE: COMPARISON WITH FINDINGS IN PATIENTS WITH FAMILIAL HYPERCHOLESTEROLEMIA AND CONTROL SUBJECTS AND VALIDATION IN A RAT MODEL

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Background: It remains unclear whether the vascular remodeling process of atherosclerosis in Kawasaki Disease (KD) differs from that in adults.

Methods: To test the hypothesis that textural changes in the carotid intima-media complex (IMC) on B-mode ultrasound are associated with early atherosclerotic involvement, 12 patients with KD and CAL (KD) without coronary risk factors (mean 17.2 years), 12 patients with heterozygous familial hypercholesterolemia (FH) (mean 15.3 years) and 9 age-matched healthy control subjects (Cont) were assessed for intima-media thickness (IMT), first-order statistics (gray-scale median (GSM), skewness, kurtosis) and second-order statistics (angular second moment (ASM), Contrast, Entropy) and findings were compared among the 3 groups. Moreover, these parameters in rat models were also compared between SHRSP.Z-Leprfa/IzmDmcr (SHRSP fatty), which show diffuse intimal and medial thickening without lipid deposition due to dyslipidemia and hypertension and SHRSP, which show medial thickening devoid of intimal thickening in the abdominal aorta. These findings in both rat models have been validated histolopathologically.

Results: The mean IMT (mm) was significantly higher in FH and KD than Cont (0.58±0.02, 0.52±0.05 vs. 0.43±0.03, p<0.001). Although KD showed significantly higher GSM than FH and Cont (both p<0.01), there were no significant differences in Skewness, Kurtosis or Contrast among the 3 groups. While KD (p<0.01) and FH (p<0.05) showed significantly lower ASM than Cont, there was no significant difference between KD and FH. Moreover, KD (both p<0.01) showed significantly higher Entropy than FH and Cont. As for the rat models, SHRSP fatty showed higher GSM than SHRSP, but there were no significant differences in other parameters between 2 models. This textural pattern in SHRSP fatty was similar to that in KD.

Conclusions: These findings suggest that higher GSM, higher Entropy and lower ASM in KD indicate alteration of tissue components and heterogeneity of IMC due to active vascular remodeling after vasculitis. This finding appeared distinct from that of adult atherosclerosis often observed in FH.