

Experimental Study on Etiological Participation of Oxidative Stress in Vasculitis by Kawasaki Disease

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BACKGROUND: Because it is recently showed that oxidative stress and inflammation amplifying each other have been implicated in the onset and progress of atherosclerotic lesion, it has been hypothesized that oxidative stress might also be related to the acute vascular disorders associated with Kawasaki disease (KD). Therefore, we have clinically investigated the dynamics of oxidative stress in the acute KD, and have reported that oxidative stress plays a very important role in the KD vasculitis. However, the etiological relationship between oxidative stress and KD vasculitis has not yet been clarified. In this study, we examined the dynamics of oxidative stress in KD model mice to reveal the etiological participation of oxidative stress in KD.

METHODS: *Candida albicans* water-soluble fraction (CAWS), which induces vasculitis such as that seen in KD, was intraperitoneally injected to DBA/2 mice for five consecutive days. At 1, 7, and 14 days after CAWS injection, mice were sacrificed. Autopsy was performed to obtain serum, hearts and spleens. We assayed reactive oxygen metabolites (ROM) as the oxidation marker, the biological antioxidant potential (BAP) as antioxidant potency, and sulfhydryl (SH) groups which are based on the capacity of thiol groups have antioxidant effect in the serum of mice. Hearts were fixed and prepared in paraffin blocks. Tissue sections were stained with H&E stain. We defined the onset of vasculitis as the presence of inflammatory cell infiltration.

RESULTS: The ROM level significantly increased on day 1 after CAWS administration and subsequently decreased. In contrast, The BAP gradually increased until day 7 but the SH groups decreased until day 7 and recovered on day 14. The Heart weight did not change. The spleen weight significantly increased on day 1 and gradually decreased. Inflammatory infiltration was observed in the adventitia of the aorta and proximal coronary arteries from day 7.

CONCLUSIONS: In the KD model mice, oxidative stress increased before the onset of vasculitis. Therefore, oxidative stress may be related to the pathogenesis of vasculitis in KD. In contrast, the antioxidant potency increase with activation of oxidative stress, and a lot of thiol groups may be used in acute KD.