1. No.
   2020G007

2. Title
   Influence of carbonylated protein on fibrinolytic activity on vascular wall and in plasma

3. Period
   2020-2021

4. Summary

Smoking is a major risk factor for abdominal aortic aneurysms (AAA). We examined surgically resected thrombi from AAA patients and showed the co-staining with anti-N acetyl 3-formyl-3,4-dehydropiperidino (FDP)-Lysine antibody, and anti-fibrinogen antibody. Acrolein, a well-known pollutant present in cigarette smoke, has diverse effects on physiological functions. We focused on how acrolein-conjugated proteins, especially carbonylated fibrinogen, affect fibrinolysis and demonstrated that purified fibrin clots generated by acrolein-treated fibrinogen showed resistance to fibrinolysis. We reported these results and suggested that carbonylation of fibrin(ogen) may contribute to the prolonged retention of thrombi in the vascular wall of AAA by making fibrin more resistant to fibrinolysis.

We further examined how cigarette smoke extract (CSE) modifies the fundamental function of coagulation/fibrinolysis-related factors in plasma. Plasma clot lysis time measured by the turbidimetric method in normal plasma was shortened by the addition of 5% CSE, unlike under purified conditions. Fluorescence-labeled plasminogen accumulation to the fibrin network formed by plasma also appeared to be enhanced by 5% CSE treatment. Suppression in the function of fibrinolytic inhibitors including thrombin-activatable fibrinolysis inhibitor and α2-antiplasmin might be also involved. Further analysis is required to know how lysine carbonylation by acrolein in CSE modified the physiologic function of these regulatory proteins in fibrinolysis.