

Platelet activation markers overexpressed specifically in aspirin exacerbated respiratory disease

Chihiro Mitsui

Sagamihara National Hospital, Japan

Background: Aspirin exacerbated respiratory disease (AERD) is characterized by respiratory reactions upon ingestion of cyclooxygenase (COX)-1 inhibitors and cysteinyl leukotriene (cysLT) overproduction. This hypersensitivity reaction is induced by aspirin at low doses that irreversibly inhibit COX-1 in platelets but not COX-2 in endothelial cells and leukocytes.

Method: First, platelet activation markers [the expression levels of P-selectin (CD62P), CD63, CD69, and GPIIb/IIIa (PAC-1) in peripheral platelets, the percentage of circulating platelet adherent leukocytes and the levels of plasma soluble P-selectin (sP-selectin) and soluble CD40 ligand (sCD40L)] were examined in stable patients with AERD (n=30), aspirin tolerant asthma (ATA; n=21) and idiopathic chronic eosinophilic pneumonia (CEP; n=10). Furthermore, the levels of plasma sP-selectin and sCD40L in AERD (n=24) and ATA patients (n=7) and surface markers on platelets in AERD patients (n=8) were also assessed during the aspirin challenge test.

Results: In stable condition, the expression levels of all surface markers on platelets (P-selectin, P=0.022; CD63, P=0.001; CD69, P=0.029; and PAC-1, P=0.014), the percentage of platelet adherent eosinophils (P=0.025) and the levels of plasma sP-selectin (P=0.017) and sCD40L (P=0.013) were significantly higher in AERD patients than in ATA patients. The expression levels of CD63 and CD69 on platelets and the plasma sCD40L level in AERD patients were higher than those in CEP patients (P<0.001, P=0.008, and P=0.028, respectively). In contrast, there were no significant differences in the expression levels of these markers among ATA patients, CEP patients and controls. In the aspirin challenge test, the levels of platelet activation markers did not change both in AERD and ATA patients. P-selectin and CD63 expressions on platelets and plasma sP-selectin and sCD40L levels positively correlated with the percentage of platelet adherent eosinophils. Among these markers, p-selectin expression and plasma sP-selectin levels positively correlated with urinary leukotriene E4 concentration. Additionally, plasma sP-selectin and sCD40L levels negatively correlated with lung function.

Conclusions: Peripheral platelets were activated to greater extent in stable AERD patients than in stable ATA patients, CEP patients and controls. Platelet activation was involved in cysLT overproductions and persistent airflow limitations in AERD in stable disease condition.

Biography

Chihiro Mitsui was graduated from Hokkaido University in 2008. After completing initial Clinical Residency Program, she has working as a Research Fellow at Sagamihara National Hospital Clinical Research Center. She has published more than 10 papers in reputed journals.

c-mitsui@sagamihara-hosp.gr.jp

Notes: