中文題目：心肌梗塞病患周邊血液中巨噬細胞，血小板及白血球與血斑塊上 Rho 激酶活性的相關性研究

英文題目：The Association of Rho Kinase Activity of Macrophages, Platelet and Leukocytes from Peripheral Blood and on Coronary Atherosclerotic Plaque During Acute Myocardial Infarction

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Introduction: Macrophages and platelets activities play very important roles in the function of stability on atherosclerotic coronary plaque. Rho kinase (ROCK), one of the small GTPase family proteins, has been considered a pathophysiological role in the development of atherosclerosis. However, it remains unclear the role of Rho-kinase activity and expression of macrophages or platelets when the acute myocardial infarction (AMI) occurs.

Hypothesis: ROCK is crucial but different on peripheral blood cells types, including macrophages, platelets and leukocytes, during the pathophysiology of AMI.

Methods: We enrolled patients with AMI (<24 hours of onset), receiving emergency procedure of cardiac catheterization. 40 patients (80% male in gender; mean 62 ± 20 years of age) were diagnosed with AMI. Another sex-and-age matched 20 stable CAD patients were enrolled as the control group. We first collected their macrophages, platelets and leukocytes from peripheral blood and compared the expression of macrophage (CD68), platelet and their Rho kinase activities by immunohistochemistry (IHC) on the plaques aspirated from the Thrombuster catheter.

Results: Compared with stable CAD patients, AMI subjects showed higher Rho kinase activities on macrophage, leukocytes, and platelet cells (all $p<0.001$). Macrophages and platelets had earlier increased ROCK activity; however, leukocytes showed a later response. We also observed pathologically rich macrophages in human coronary plaque rupture. Interestingly, the expression of Rho kinase activity localized similarly to the macrophages. The ROCK associated proteins, including RhoA, myosin light chain, meosin and ezerin were all enhanced in the ex vivo macrophages isolated from AMI groups (all $p<0.05$). Mimicking AMI status, on THP-1 macrophage cells, adding thrombin could also enhance the expression of ROCK activity, including p-MBS, p-MYPT, accordingly.

Conclusions: We showed a higher activity of ROCK pathway on macrophages, platelets and leukocytes during AMI. The expression of macrophages and ROCK proteins were abundant over the AMI plaques. These results support our hypothesis that ROCK can be crucial under acute thrombosis event and possibly affect the actin assembly function on the blood cells.