

PLATELET-DERIVED GROWTH FACTOR PRODUCTION DURING THE PLATELET RELEASE REACTION INDEPENDENT OF THE ENDOPEROXIDE PATHWAY. I.O. Ilnatowycz, J-P. Cazenave, S. Moore, J.F. Mustard, McMaster University, Hamilton, Ontario, Canada.

Ross et al (P.N.A.S. 71:1207, 1974) showed that a platelet-derived growth factor (PGF) promotes the proliferation of arterial smooth muscle cells (SMC) and thus may be important in atherogenesis. Although PGF is found in plasma when platelets are exposed to thrombin or collagen, it has not been conclusively established that the material is released from platelet granules. Inhibitors of the release reaction and of platelet cyclo-oxygenase were used to examine the relation between release of ^{14}C -serotonin (^{14}C -5HT) from rabbit platelets and the appearance of PGF in the suspending fluid. Washed platelets ($2 \times 10^6/\text{mm}^3$) were suspended in Tyrode solution containing albumin and apyrase at 37°C and treated with collagen suspension, thrombin or ADP. After 5 min. the platelets were removed and the supernate assayed for ^{14}C -5HT, malondialdehyde (MDA) and PGF. Incorporation of ^3H -thymidine into cultured rabbit aorta SMC DNA was used as an index of PGF concentration. There was a direct relation between the concentration of collagen or thrombin and the amount of PGF in the supernate. Indomethacin (20 μM) or sulfinpyrazone (1mM) reduced ^{14}C -5HT release in response to collagen from 45-65% to 5-8%, completely blocked MDA formation and reduced the amount of PGF in the supernate to 33-44% of control values. These inhibitors reduced release caused by thrombin (5U/ml) from 90-95% to 85-88% and, although they completely blocked MDA formation, did not decrease PGF. PGF was not made available by aggregation of platelets with ADP. (Release does not occur with rabbit platelets exposed to ADP). Thus, the appearance of PGF does not depend on primary aggregation but is associated with the release reaction and is independent of the endoperoxide pathway.

GAMMA CAMERA DETECTION OF EXPERIMENTAL PULMONARY EMBOLI AFTER PERIPHERAL INJECTION OF INDIUM-111 LABELED PLATELETS. G. McIlmoyle, H.H. David, M.J. Welch, J.L. Primeau, B.A. Siegel, and L.A. Sherman. Washington University School of Medicine, SCOR in Thrombosis, St. Louis, Missouri, U.S.A.

A simple, noninvasive method for the direct visualization of pulmonary emboli would be of considerable value for the diagnosis of this common disorder, especially in patients who have underlying parenchymal lung disease or are too ill to undergo pulmonary angiography. For this purpose, we have investigated the accumulation of In-111 platelets in acute pulmonary emboli. Radiolabeled venous thrombi were produced in 6 dogs by the injection of human thrombin and Tc-99m sulfur colloid into occluded segments of both jugular veins. One hour later, the thrombi were released and gamma camera images demonstrating the position of the Tc-99m labeled pulmonary emboli were obtained. Autologous platelets labeled with In-111 oxine were then injected peripherally and sequential images were obtained for one hour. The dogs were then sacrificed, and the emboli and tissue samples were removed and assayed for activity. Sixteen pulmonary emboli containing Tc-99m sulfur colloid were seen by imaging and 14 of these were detected with In-111 platelets; 5 emboli were visualized immediately and uptake in the remaining 9 appeared on later images. In all animals, at least one embolus was detected by imaging. Mean embolus weight was 538 mg, mean In-111 uptake was 1.09% dose/g embolus, and mean embolus/blood ratio was 16.1. In 2 animals, images showed additional foci of increased In-111 uptake, distal to an embolus containing Tc-99m; this uptake may reflect thrombus propagation. Our results demonstrate that acute pulmonary emboli in dogs can be readily detected by imaging with In-111 labeled platelets, injected after embolization.