PLATELET SURVIVAL USING ASPIRIN: STUDIES IN PATIENTS WITH ARTIFICIAL CARDIAC VALVES. S.H. Goodnight, L.M. Montgomery, K. Sheth and G.M. Pipoly. University of Oregon Health Sciences Center, Portland, Oregon, U.S.A.

Studies using ^{51}Cr -labeled platelets have shown reduced platelet survival in patients with artificial cardiac ball valves. Recently, a simple non-radioisotopic method for measuring platelet survival has been developed by Stuart (NEJM 292:1310, 1975) based on the concept that aspirin (ASA) irreversibly inhibits lipid peroxidation of circulating platelets. This method was used to determine platelet survival in 20 control subjects, 8 patients with normally functioning Starr-Edwards artificial cardiac valves (cardiac catheterization 5/8) and 4 patients with documented prosthetic valve dysfunction. The $T_{1/2}$ (best fit to an exponential curve) for control subjects was 4.0 ± 0.7 (1 SD) days with a range of 3.0 to 5.6 days. The $T_{1/2}$ of normally functioning artificial valves was less than that of the control subjects (3.3 ± 0.3 days, range 3.1 - 3.8 days, $p < 0.05$). Moreover, the patients with valves that were obstructed or had a periprosthetic leak had a $T_{1/2}$ of 2.7 ± 0.1 days, which was significantly shorter than either the controls or the patients with normally functioning artificial valves ($p < 0.01$). Two additional valve patients also showed shortened platelet survival (subacute bacterial endocarditis - $T_{1/2}$ 2.9 days, acute intimal tear of the aorta - $T_{1/2}$ 2.5 days) and 2 patients without prostheses who were taking dipyridamole had normal platelet survival ($T_{1/2}$ 4.0, 3.3 days). These results indicate that the ASA method for determining platelet survival identifies shortened platelet survival in patients with artificial cardiac valves and may be a useful non-invasive tool to detect prosthetic valve dysfunction.

METHYLATED TYPE I COLLAGEN AS A NEW TOOL FOR PLATELET FUNCTION TESTS. L.Balleisen K.Kühn, R.Marx. Medizinische Universitätsklinik Münster, Max Planck Institut für Biochemie München, Medizinische Universitätsklinik München, Germany.

Methylated type I collagen with blocked carboxylic groups was used for testing platelet aggregation and adhesion on collagen, and as thrombogenic substance in experimental animals. This modified collagen is soluble in buffers at neutral pH, but when added to plasma immediately precipitates. Its platelet aggregation activity as tested by the inhibitory action of ASS and by the depression or absence of collagen induced platelet aggregation in uremia and thrombasthenia was comparable to fibrillar collagen. Preincubation of platelets with Antimycin A and 2-Deoxyglucose also inhibited platelet aggregation by meth. collagen. In a new test for measuring platelet adhesion on collagen, platelets and meth. collagen were rotated in a silastic tube; the decrease of platelets was determined. Furthermore, meth. collagen can be used as a thrombogenic substance in rabbits: The recorded decrease of platelets after injection of meth. collagen can be inhibited by pre-treatment with ASS. Summarizing, meth. collagen, which can be stored over one year in lyophilised or frozen form without a decrease of activity, is a substance with the biochemical characteristics of collagen, which allows handling as a dissolved collagen but behaves like a fibrillar collagen.