
Vascular prostacyclin (PGI₂) generation is decreased in diabetes in experimental animals and in man. In this study, we have investigated the possibility that levels of a plasma factor(s) modifying PGI₂ production are abnormal in diabetes. Vascular endothelial cells from diabetic and control rats were washed in Krebs buffer to reduce endogenous PGI₂ formation. Addition of rat or human cell-free plasma stimulated PGI₂ release by the "exhausted" vascular rings, and this activity was still present after freezing and thawing. The stimulation of PGI₂ synthesis by control tissue was significantly greater (p<0.001) with plasma from diabetic animals (0.25±0.04ng/mg) than from controls (0.05±0.02ng/mg). Similarly, plasma from diabetic volunteers showed increased (p=0.05) PGI₂-stimulatory activity. Diabetic tissue was less responsive than control tissue to stimulation by diabetic plasma, and the difference between diabetic and control plasma was not apparent. This suggests that the abnormal vascular PGI₂ synthesis in diabetes may be due to a defect in the vessel wall and not to lack of stimulatory plasma factors.


It is known that platelet hyperaggregation observed in diabetic patients is, at least in part, due to an increased activity of the endoperoxide-thromboxane or arachidonic acid pathway. It was interesting to determine the platelet malondialdehyde (MDA) production in normal and diabetic pregnancies. Following these individuals have been studied: /I/ twenty-five healthy non-pregnant volunteers; /II/ thirty women in third trimester of non-complicated pregnancies; /III/ twenty two diabetic pregnant women without retinopathy; /IV/ fifteen diabetic pregnant women with retinopathy. Platelet MDA production following N-ethyl-maleimide induced aggregation was measured according to Court et al. The mean value of MDA production was similar in volunteers and normal pregnant women (SDM, 7.0±10.73 nmol MDA per 10⁷ platelets; 7.2±2.61). The mean MDA production in diabetic women without retinopathy was slightly but non-significantly higher than that in normal pregnant women (7.5±2.02; p>0.05). The corresponding value in diabetic women with retinopathy was significantly higher than the values in the other three groups (8.4±0.01; p<0.001). These results suggest that the activation of prostaglandin synthetic pathway measured by MDA is significantly increased in diabetic pregnancy complicated by retinopathy. The increase of platelet prostaglandin synthesis in diabetic pregnancy might play an important role in initiating and/or promoting the small-vessel complications of placenta.


Reduced levels of prostaglandin I₂ (PGI₂) may contribute to the platelet hyper-reactivity and vascular complications found in diabetes mellitus. This study compared PGI₂ production (PGI₂-like activity and 6-keto-PGF_

Increased platelet aggregation and decreased sensitivity of platelets to synthesized prostacyclin in alloxan-diabetic rabbits. K. Yamada, T. Yoda, Y. Goto, T. Hirota and K. Serizawa. The Third Department of Internal Medicine, Tohoku University School of Medicine, Sendai, Japan.

Platelet aggregation and sensitivity of platelets to prostacyclin were examined with a view to clarify platelet function in alloxan-diabetic rabbits. Diabetic rabbits were obtained by intravenous injection of alloxan (100mg/kg body weight) and range of plasma glucose in these diabetic rabbits was 350-500mg/100ml. Blood was collected from the central artery of the ear of normal and alloxan-diabetic rabbits. Platelet aggregation was measured turbidimetrically as rate of light transmission at maximal aggregation to light transmission of platelet poor plasma by a NIKK aggregometer (Tokyo, Japan). Platelet aggregation was induced by ADP with each final concentration of 0.5, 1.0, 2.0 and 6.0 μM. Sensitivity of platelets to synthesized prostacyclin (Ono Pharma, Co., Tokyo, Japan) was represented as prostacyclin concentration of fifty percent inhibition of ADP-induced platelet aggregation. Platelet aggregation rate in normal and alloxan-diabetic rabbits was as follows; 8.4±1.0, 22.8±2.6% (0.5 μM), 22.3±1.5, 55.2±4.5% (1.0 μM), 37.1±1.7, 70.0±2.6% (2.0 μM), 51.3±2.2, 66.7±1.0% (6.0 μM) (Mean±SE. P<0.001). Prostacyclin concentration of fifty percent inhibition of ADP-induced platelet aggregation in normal and alloxan-diabetic rabbits was as follows; 42.7±1.6, 68.5±10.4 (Mean±SE. P<0.01).

In conclusion, platelets of alloxan-diabetic rabbits presented a significant decrease in sensitivity to synthesized prostacyclin as compared to platelets from normal rabbits, with a significant increase in ADP-induced platelet aggregation.