Tuesday, July 14, 1981

Poster Presentations

Vessel Wall – II

11:00–12:30 h

Grand Ballroom Lobby Boards 207–212

0391

EFFECTS OF PENTOXIFYLLINE, PENBUTOLOL, PRENYLAMINE, CLOFIBRIC ACID AND NICOTINIC ACID ON THE RELEASE OF PROSTACYCLIN-(PGI_2-) LIKE ACTIVITY FROM RAT AORTA IN VIVO AND IN VITRO. K.U. Weithmann. Hoechst AG, Frankfurt Germany.

Aortas from rats, treated with 5-20 mg/kg of pentoxifylline (pof), penbutolol, prenylamine, clofibric acid or nicotinic acid showed, ex vivo, a significantly higher release of acid labile PGI_2-like anti-aggregatory activity compared to controls. This activity could be suppressed by pre-treatment with 2 mg/kg Indomethacin. When incubated with rat aortas in vitro, pof showed a similar stimulatory effect on PGI_2-like release, whereas clofibric- and nicotinic acid had no significant effect in this system. Pof and all other drugs mentioned above in therapeutical concentrations had virtually no effect on induced aggregation of human platelets in vitro. However, in the presence of small amounts PGI_2 in vitro, inhibition of aggregation and platelet cyclic AMP are enhanced synergistically above the effects of PGI_2 and pof individually.

We conclude from these experiments that therapeutic doses of all drugs in our study stimulate in vivo the release of PGI_2-like activity from vessel walls, thus inhibiting platelet aggregation in vivo. The primary site of action of pof seems to be the vessel wall, whereas the effect of clofibric acid and nicotinic acid on the vessel walls seem to be secondary. The elevation of platelet cyclic AMP levels which generally parallels PGI_2-induced inhibition of aggregation might be further enhanced by pof known as an inhibitor of platelet cyclic AMP phosphodiesterase, thus explaining the observed synergistic effects between PGI_2 and pof.

0392

REDUCED ARTERIOSCLEROTIC PLAQUE THROMBUS FORMATION. M. Dujovny, N. Kossovsky, J-M. Loubeau, R. Segal, D. Nelson. Department of Neurological Surgery, University of Pittsburgh School of Medicine and V.A. Medical Center, Pittsburgh, Pennsylvania, U.S.A.

Sixty surgical patients with cerebrovascular accidents and angiographically diagnosed carotid plaques were divided into two groups: 1) pre-treatment with aspirin (650mg/day) and dipyridamol (25mg/tid) (42 patients); 2) no treatments (18 patients). The control group consisted of 10 autopsy of patients dying for unrelated cause.

SEM examination of the endarterectomy plaque revealed intact red blood cells in 12 of 42 pre-treated and 18 of 18 untreated specimens; degenerating red blood cells and cell fragments (24/42, 18/18); fibrin (24/42, 18/18) and white blood cells (15/42, 18/18). These were frequently enmeshed in large surface thrombi. Cholesterol crystals (6 µm) were matted on the plaque surface (12/42, 15/18), and spherical globules averaging 3 to 10 µm sporadically blanketed the surface (6/42, 6/18). Plaque from the asymptomatic controls was smaller and less thrombotic. Energy dispersive analysis x-rays (EDAX) of the inner surface of all 70 specimens (50 years old +) revealed surface calcium deposits and nodules in 18 of the surgical cases (12/42, 6/18), and diffuse calcium deposits in 6 controls.

Treatment with aspirin and dipyridamol significantly reduces plaque thrombosis.

0393

COMPARISON OF HUMAN SMC FROM AORTA, ART. ILIACA, VENA CAVA AND FETAL UMBILICAL CORD VEIN. A TEM-,SEM-,LIGHT MICROSCOPIC AND FUNCTIONAL STUDY. D.G.S. Thilo, D. Heinrich. Department of Internal Medicine (Prof. Dr. Dr. H.-G. Lasch), University of Giessen, Klinikstr: 36, D-63-Giessen, FRG.

Do smooth muscle cells (SMC) from various human origin show the same behavior in cell culture? Are there differences between arterial, venous and fetal SMCs? Explant cultures were established from human adult aorta, art. iliaca comm., vena cava. SMCs from the umbilical cord vein and art.iliaca were harvested by the collagenase method. All cells were grown in M 199, 20 mM Hepes, 20% fetal calf serum, pen.-strept, 37°C, without CO_2. After sufficient outgrowth the cells were subcultivated. At various subpassages the cells were processed for TEM, SEM. For TEM the ruthenium-red-method were applied. At different subpassages growth curves were established. Growth pattern was monitored by phase contrast microscopy and staining with fluorescent dyes.--Results: V.cava SMC grow out of the explant faster, however, show slower proliferation rate than the art.SMCs. V.cava and fetal SMCs do not show the striking hill-valley growth pattern as the art.SMCs do. From fetal to adult SMCs the cell- and nucleus size increases. The varying nucleus sizes were monitored by impulscytophotometry. These results are reported in another abstract. From the art.iliaca comm. growing SMCs with up to 10 nuclei were harvested. Art.SMCs secret large amount of granular material which is not seen in venous SMCs. All cells were negative for F-VIII-antigen in the immunfluorescence.

Summary: Because of these marked differences between art. and venous SMCs from human origin evaluation of experiments with SMCs have to take this into consideration before drawing general conclusions on SMC-functions.