P-02-29 DISRUPTION OF THE CAPILLARY ENDOTHELIAL GLYCOCALYX DURING HYPOXIA, ISCHAEMIA AND REPERFUSION

Barbara J. Ward, Dept. of Anatomy, Queen Mary and Westfield College, London E1 4NS, U.K.

WITHDRAWN

P-02-30 IDENTIFICATION OF ENDOTHELIUM-DERIVED CONTRACTING FACTOR 1

Masahito Muramatsu, Kiyokazu Shimizu, Hiroshi Asano, Yoshio Iwama, Yukio Toki, Yutaka Miyazaki, Kenji Okumura, Hidekazu Hashimoto, Takayuki Ito. Nagoya Univ. School of Medicine, Nagoya, Japan.

The purpose of the present experiment was to identify endothelium-derived contracting factor 1 ($EDCF_1$) which is supposed to be synthesized and released by endothelial cells under hypoxia. Rings prepared from spontaneously hypertensive rat (SHR) aorta and canine coronary artery were suspended for isometric tension recording in organ chamber filled with oxygenated Krebs-Henseleit buffer. Severe (Po_2=50±2 torr) or moderate (Po_2=110±3 torr) hypoxia was induced by changing the O_2 content in the bubbling gas. In SHR aorta precontracted with norepinephrine (NE) (10^{-7}M), severe hypoxia caused initial increase in tension of 36.7±7.5% followed by 57±5% relaxation. Pretreatment with N^{ω}-nitro-L-arginine methylester (NNM) (10^{-3}M) which completely inhibits endothelium-derived nitric oxide production, augmented NE-induced precontraction by 76±12% and totally eliminated hypoxic contraction. Moderate hypoxia caused sustained increase in tension of 20.6±2.5% and minimal relaxation. In addition, in canine coronary arterial rings precontracted with KCl (30mM), in the presence of indomethacin (10^{-5}M), severe hypoxia caused sustained increase in tension of 62±5%. Pretreatment with NNM (10^{-3}M) also abolished hypoxic contraction. Post-treatment of NNM caused sustained contraction in endothelium-intact SHR aortic and canine coronary rings under normoxia. In conclusion, contractile response considered to be induced by $EDCF_1$ is not caused by vasoconstricting substance released under hypoxia, but rather is a vasoconstricting phenomenon based on continuous inhibition of NO synthesis and/or release under hypoxia.

P-02-31 EFFECTS OF ET-3 ON MICROVASCULAR PERFUSION AND THE ULTRASTRUCTURE OF MYOCARDIUM

Linda Maxwell, John Gavin, Department of Pathology, University of Auckland School of Medicine, Auckland, New Zealand.

Endothelins are potent vasoconstrictors and increased plasma levels and expression of endothelin receptors follow myocardial ischaemia and reperfusion. This suggests they may contribute to post-ischaemic microvascular incompetence. Isolated perfused rat hearts were given 20μg ET-3 in 0.2ml phosphate buffer by injection into the side arm of a Langendorff perfusion apparatus. After 5 min the hearts were perfused with 2.5% glutaraldehyde then with nuclear track photographic emulsion to identify perfusable vessels. Resin embedded sections were examined by scanning and transmission electron microscopy. Significant segmental reductions occurred in the proportion of competent capillaries in the left ventricle, with less marked but more uniform reductions in the right ventricle. Thus ET-3 can profoundly reduce microvascular perfusion of normal myocardium but the segmental pattern is unlike the transmural gradient observed following post-ischaemic reperfusion. In addition, regions with few competent capillaries contained myocytes with a loss of glycogen and distinctive intramitochondrial vacuolation similar to that produced by adriamycin and excessive thyroxine. Supported by the Auckland Medical Research Foundation.