The failure of antihypertensive drugs to reduce coronary heart disease (CHD) may be related to their failure to affect beneficially other mediators of CHD including platelet activity and aggregation. We have studied, therefore, plasma beta-thromboglobulin levels (BG), a specific marker of in-vivo platelet activation in 24 patients with untreated hypertensives, 12 receiving calcium channel blockers and 16 patients receiving angiotensin converting enzyme (ACE) inhibitors. Data are presented as means and standard errors and statistical analysis was by unpaired student t-tests. 

Untreated hypertensives had significantly elevated BG levels compared with controls (78.3 ± 2.1 ng/ml and 48.0 ± 1.6 ng/ml respectively p < 0.031). Plasma BG levels in patients receiving beta blockers and diuretics were not significantly different from the untreated hypertensives (87.2 ± 2.1 ng/ml and 68.0 ± 1.5 ng/ml respectively, (p = 0.53 and > 0.01). Treatment with calcium channel blockers was associated with lower BG levels (53.3 ± 2.0 ng/ml) but this difference was not statistically significant. By contrast, treatment with ACE inhibitors was associated with significantly lower plasma BG levels compared with the untreated group (46.3 ± 1.3 ng/ml p < 0.015).

We conclude that antihypertensive drugs may have different effects on in-vivo platelet activation. Beta blockers and diuretics did not improve the already activated platelets in patients with essential hypertension and calcium channel blockers had an insignificant effect. By contrast, ACE inhibitors did normalize in-vivo platelet activation. It is possible, therefore, that ACE inhibitors may have benefits in the prevention of CHD which is not shared by other drugs.

**84 EFFECTS OF INSULIN ON THE RENIN-ANGIOTENSIN AND SYMPATHETIC NERVOUS SYSTEMS**

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To examine the effects of physiological concentrations of insulin upon the renin-angiotensin and sympathetic nervous systems, ten healthy subjects were studied by the euglycaemic glucose clamp technique with sequential 60 minute 0.5 and 1.0 ml/min insulin infusions. Each subject had a subsequent control study simulating clamp conditions except that no insulin was given and 2.5% instead of 20% dextrose was administered. Plasma renin activity increased from 0.88±0.13 ng/ml/h basally to 0.97±0.15 ng/ml/h (p<0.05) to 1.40±0.16 ng/ml/h (p<0.001) during the 0.5 and 1.0 ml/kg/min insulin infusion but did not change during control infusion (0.90±0.30 ng/ml/h to 0.93±0.15 ng/ml/h to 0.96±0.14 ng/ml/h respectively). Aldosterone did not change significantly from baseline during insulin (239±89 pmol/l to 237±50 pmol/l to 213±87 pmol/l) or control infusion (222±79 pmol/l to 220±32 pmol/l to 208±83 pmol/l). Noradrenaline increased during both insulin (1.03±0.20 nmol/l to 1.14±0.18 nmol/l to 1.27±0.17 nmol/l (p<0.01) and control infusion (0.86±0.09 nmol/l to 0.97±0.09 nmol/l to 0.99±0.11 nmol/l (p<0.01)). However, increase above baseline during 1.0 ml/kg/min infusion was greater (p<0.05) then during control infusion.

Similarly adrenaline increased from baseline during both insulin and control infusions but there was no difference between the two infusion days. Change in systolic blood pressure from baseline was significantly greater during the insulin than control infusion (46±3 vs 1±1 mmHg (p<0.001). In conclusion acute physiological elevation of insulin produces detectable stimulation of the renin-angiotensin and sympathetic nervous systems and may affect systolic blood pressure.

**85 INFLUENCE OF EXERCISE HEART RATE ON THE RESULTS OF QUANTITATIVE PLANAR STRESS THALLIUM-201 SCINTIGRAPHY**

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Submaximal myocardial hyperaemia during exercise caused by significant coronary artery stenosis results in abnormally slow myocardial T1-201 washout. However a submaximal exercise heart rate (HR) may also result in abnormal T1-201 washout. The effect of exercise HR on the detection of coronary artery disease (CAD) was therefore studied in 295 consecutive patients undergoing exercise stress T1-201 scintigraphy and coronary angiography. A total of 382 normal coronary artery territories and 503 diseased coronary arteries were studied. Patients were divided into Group A (n=56) achieving <75% maximum predicted heart rate (MPHR), Group B (n=59) achieving 75% to 84% MPFR and Group C (n=180) achieving >85% MPFR. The sensitivity (SENS) for detecting disease in individual coronary arteries using the presence of a perfusion defect alone vs perfusion defect or slow T1-201 washout was 61% vs 86% for Group B vs 51% vs 86% for Group A and 59% vs 72% for Group C. Although SENS was significantly improved by the addition of a slow T1-201 washout rate the specificity (SPEC) fell from 72% to 36% for Group A and from 69% to 47% for Group B. SPEC was not altered significantly for Group C (79% to 73%). Addition of slow washout as a diagnostic criterion improved detection of disease in Group C (p<0.0005) but did not alter disease detection in Groups A or B (both p=NS). In patients with a perfusion defect, prediction of disease was enhanced by the use of slow washout as a criterion but this effect was only observed in patients in Group C (p<0.01). Thus addition of slow T1-201 washout as a diagnostic criterion improves detection of disease in patients with >85% MPFR but is associated with a high false positive rate in those attaining a lower exercise HR response, probably because of submaximal hyperaemia induced during exercise.

**86 DEVELOPMENT OF A NEW ISOTOPE TECHNIQUE TO MEASURE BLOOD VOLUME IN THE RAT**

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Experimental manipulation of blood volume (BV) to study chronic non-euvolaemic states in rats is an established technique. Accuracy in determining changes in volume is limited due to the lack of a simple and reliable measurement. Most studies rely on change of haematocrit or albumin concentration, which are subject to error and fail to provide a measure of absolute volume. Conventional techniques to measure whole BV use dye dilution techniques or require prelabelling of red blood cells or albumin, which is cumbersome.

Indium is a short half life (100 min.) gamma emitter which can be given intravenously as InCl3 in which it forms a freely transferable to ferric transferrin. We present preliminary data on the use of this isotope in the rat. The rat is anaesthetised using halothane and a 24g cannula inserted percutaneously into the external jugular vein such that its tip lies in the corresponding anterior vena cava. 0.4 MBq InC13 is injected at 2, 4 and 6 minutes for assay of radioactivity and measurement of haematocrit. Corrections are made for dead space losses and radioactive decay by assaying syringes after injecting the animal, and comparison of standards. The jugular vein is ligated and the animal allowed to recover. Both jugular veins may be used on separate occasions without apparent ill effects, thus allowing quantification of changes in blood volume resulting from experimental procedures.

Results (n=38): BV (ml/kg) = 74.6 ± 1.4 (mean ± SEM) % of body weight for rats of 200-375 grams, coeff. of variation 11.6%.

We conclude that this technique may provide an economical and reproducible method of measuring BV in the rat.