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Iqbal Malik, Editor

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Ischaemic heart disease

High incidence of undiagnosed diabetes mellitus in patients with AMI ► Of 181 consecutive non-diabetic patients with acute myocardial infarction (AMI), 35% (95% confidence interval (CI) 28% to 43%) and 40% (95% CI 32% to 48%) had impaired glucose tolerance at discharge and after three months, respectively, while 31% (95% CI 24% to 38%) and 25% (95% CI 18% to 32%) had previously undiagnosed diabetes mellitus. Independent predictors of abnormal glucose tolerance at three months were concentrations of HbA_{1c} at admission ($p = 0.024$) and fasting blood glucose concentrations on day 4 ($p = 0.044$).

▲ **Norhammar A**, Tenerz Å, Nilsson G, Hamsten A, Efendíc S, Rydén L, Malmberg K. Glucose metabolism in patients with acute myocardial infarction and no previous diagnosis of diabetes mellitus: a prospective study. *Lancet* 2002;**359**:2140–4.

Prevention of NIDDM with acarbose ► Over 1400 patients with impaired glucose tolerance were randomly allocated to 100 mg acarbose or placebo three times daily. At a mean follow up of 3.3 years, 211 (31%) of 682 patients in the acarbose group and 130 (19%) of 686 on placebo had discontinued treatment. Non-insulin dependent diabetes mellitus (NIDDM) developed in 221 (32%) patients randomised to acarbose and 285 (42%) randomised to placebo (relative hazard 0.75, 95% CI 0.63 to 0.90; $p = 0.0015$). The most frequent side effects to acarbose treatment were flatulence and diarrhoea.

▲ **Chiasson J-L**, Josse RG, Gomis R, Hanefeld M, Karasik A, Laakso M, for the STOP-NIDDM Trial Research Group. Acarbose for prevention of type 2 diabetes mellitus: the STOP-NIDDM randomised trial. *Lancet* 2002;**359**:2072-7.

Troponins are still predictive in patients with ACS plus renal failure ► Troponin T is renally cleared and so may remain elevated for long periods in patients with renal impairment. In the GUSTO IV trial, death or myocardial infarction occurred in 581 of > 7000 patients. Among patients with a creatinine clearance above the 25th centile value of 58.4 ml per minute, an abnormally elevated troponin T concentration (> 0.1 ng/ml) was predictive of an increased risk of myocardial infarction or death (7% *v* 5%; adjusted odds ratio (OR) 1.7, 95% CI 1.3 to 2.2; $p < 0.001$). Among patients with a creatinine clearance in the lowest quartile, an elevated troponin T concentration was similarly predictive of increased risk (20% *v* 9%; OR 2.5, 95 % CI 1.8 to 3.3; $p < 0.001$).

▲ **Aviles R**, Askari AT, Lindahl B, Wallentin L, Jia G, Ohman EM, Mahaffey KW, Newby LK, Califf RM, Simoons ML, Topol EJ, Berger P, Lauer MS. Troponin T levels in patients with acute coronary syndromes, with or without renal dysfunction *N Engl J Med* 2002;**346**:2047–52.

Syndrome X patients may have subendocardial ischaemia ► Previous work suggests that there may be abnormal pain sensation or abnormal microvasculature in syndrome X patients. Now cardiovascular magnetic resonance imaging has demonstrated subendocardial hypoperfusion during the intravenous administration of adenosine, which is associated with intense chest pain. These data support the notion that the chest pain may have an ischaemic cause.

▲ **Panting JR**, Gatehouse PD, Yang G-Z, Grothues F, Firmin DN, Collins P, Pennell DJ. Abnormal subendocardial perfusion in cardiac syndrome X detected by cardiovascular magnetic resonance imaging. *N Engl J Med* 2002;**346**:1948–53.

Unstable angina is not caused by a single vulnerable plaque ► Previous studies suggest that there is more than one complex plaque in patients with unstable angina. This is backed up in this study which shows that the inflammation (as measured by neutrophil myeloperoxidase depletion) is present in aortic blood and in the venous drainage of the left coronary artery, irrespective of the site of coronary stenosis. There is a transmyocardial gradient of activation in unstable angina not seen in stable angina or variant angina.

▲ **Goldstein JA**, Demetriou D, Grines CL, Pica M, Shoukfeh M, O'Neill WW. Multiple complex coronary plaques in patients with acute myocardial infarction. *N Engl J Med* 2000;**343**:915–22.

▲ **Buffon A**, Biasucci LM, Liuzzo G, D'Onofrio G, Crea F, Maseri A. Widespread coronary inflammation in unstable angina. *N Engl J Med* 2002;**347**:5–12.

The end of in-stent restenosis? ► Restenosis after coronary stenting occurs in 20–30% of cases. The development of stents coated with sirolimus or paclitaxel looks like a promising new approach to inhibit smooth muscle proliferation within stents. The RAVEL trial suggests that restenosis rates are close to zero in the sirolimus coated arm and > 25% in the standard stent arm. The benefits were maintained at one year. The disadvantage is that the coated stents may cost three times as much as ordinary stents.

▲ **Morice M-C**, Serruys PW, Sousa JE, Fajadet J, Hayashi EB, Perin M, Colombo A, Schuler G, Barragan P, Guagliumi G, Molnàr F, Falotico R, for the RAVEL Study Group. A randomized comparison of a sirolimus-eluting stent with a standard stent for coronary revascularization. *N Engl J Med* 2002;**346**:1773–80.

High dose statins reduce MACE whether or not PTCA is done ► A lot was made of the AVERT trial comparing 80 mg atorvastatin versus coronary angioplasty (PTCA) for low risk patients. Clearly lipid lowering reduced event rates more that just PTCA. The LIPS trial answers the obvious question of whether early lipid lowering after PTCA has additional benefits. The average low density lipoprotein cholesterol concentration was 3.4 mmol/l, and follow up was for four years. Major adverse cardiac events (MACE) were reduced from 26.7% in the placebo arm to 21.4% (relative risk (RR) 0.78, 95% CI 0.64 to 0.95; $p = 0.01$). There were trends to reduction in death, MI, and revascularisation rates. This suggests that early statin treatment should be given in nearly all patients undergoing PTCA.

▲ **Pitt B**, Waters D, Brown WV, van Boven AJ, Schwartz L, Title LM, Eisenberg D, Shurzinske L, McCormick LS. Aggressive lipid-lowering therapy compared with angioplasty in stable coronary artery disease. Atorvastatin versus revascularization treatment investigators. *N Engl J Med* 1999;**341**:70–6.

▲ **Serruys PWJC**, de Feyter P, Macaya C, Kokott N, Puel J, Vrolix M, Branzi A, Bertolami MC, Jackson G, Strauss B, Meier B, for the Lescol Intervention Prevention Study (LIPS) Investigators. Fluvastatin for prevention of cardiac events following successful first percutaneous coronary intervention. A randomized controlled trial. *JAMA* 2002;**287**:3215–22.

10% annual rupture rate for AAA >5.5 cm that are left alone ► Of 198 veterans whose abdominal aortic aneurysm (AAA) was left alone for medical reasons or refusal to have surgery, 57% had died after an average follow up of 1.5 years. The one year incidence of probable rupture by initial AAA diameter was 9.4% for AAA of 5.5–5.9 cm, 10.2% for AAA of 6.0–6.9 cm (19.1% for the subgroup of 6.5–6.9 cm), and 32.5% for AAA of 7.0 cm or more. Much of the increased risk of rupture associated with initial AAA diameters of 6.5–7.9 cm was related to the likelihood that the AAA diameter would reach 8.0 cm during follow up, after which 25.7% ruptured within six months. Percutaneous insertion of covered stents may provide a non-surgical solution in the future.

▲ **Lederle FA**, Johnson GR, Wilson SE, Ballard DJ, Jordan WD, Blebea J, Littooy FN, Freischlag JA, Bandyk D, Rapp JH, Salam AA, for the Veterans Affairs Cooperative Study 417 Investigators. Rupture rate of large abdominal aortic aneurysms in patients refusing or unfit for elective repair. *JAMA* 2002;**287**:2968–72.

General cardiology

Biventricular pacing improves symptoms in heart failure ► In a randomised controlled trial of 450 patients, those whose biventricular pacemakers were turned on had subjective (New York Heart Association class, quality of life) improvements in their condition as well as improvements in objective markers. There was an improvement in the distance walked in six minutes (39 m *v* 10 m, p = 0.005), time on the treadmill during exercise testing (81 s *v* 19 s, p = 0.001), and ejection fraction (+4.6% *v* –0.2%, p < 0.001). In addition, fewer patients in the group assigned to cardiac resynchronisation than control patients required hospitalisation (8% *v* 15%, p < 0.05). The trial was not powered to detect a mortality advantage for this treatment. There is a risk with the procedure and two patients died as a result of the implantation.

▲ **Abraham WT**, Fisher WG, Smith AL, Delurgio DB, Leon AR, Loh E, Kocovic DZ, Packer M, Clavell AL, Hayes DL, Ellestad M, Trupp RJ, Underwood J, Pickering F, Truex C, McAtee P, Messenger J, for the MIRACLE Study Group. Cardiac resynchronization in chronic heart failure. *N Engl J Med* 2002;**346**:1845–53.

Infective endocarditis still has an in-patient mortality of 16% ► A French registry of 390 cases of infective endocarditis in 1999 showed that, compared to 1991, mortality had reduced from 21.6% to 16.6%. In addition, patients without prior heart disease made up 4% of cases. The population incidence of infective endocarditis is 31 per million, except in New Caledonia, where it is 161 per million.

▲ **Hoen B**, Alla F, Selton-Suty C, Béguinot I, Bouvet A, Briançon S, Casalta J-P, Danchin N, Delahaye F, Etienne J, Le Moing V, Leport C, Mainardi J-L, Ruimy R, Vandenesch F, for the Association pour l'Etude et la Prévention de l'Endocardite Infectieuse (AEPEI) Study Group. Changing profile of infective endocarditis: results of a 1-year survey in France. *JAMA* 2002;**288**:75–81.

Tennis prevents heart disease but baseball does not ► In 1000 medical students followed for 40 years, sporting activity was related to cardiovascular health. After adjustment for father's occupation, parental incidence of cardiovascular disease, serum cholesterol conentration, cigarette smoking, body mass index, and hypertension during follow up, the relative hazard of developing cardiovascular disease was 0.56 (95% CI 0.35 to 0.89) in the high ability group and 0.67 (95% CI 0.47 to 0.96) in the low ability group, compared with the no-ability group. Strangely, other sports did not have this effect, perhaps as they could not be maintained as one ages.

▲ **Houston TK**, Meoni LA, Ford DE, Brancati FL, Cooper LA, Levine DM, Liang K-Y, Klag MJ. Sports ability in young men and the incidence of cardiovascular disease. *Am J Med* 2002;**118**:689–95.

Basic science

How LVH turns to heart failure in long standing pressure overload ► Gq proteins couple membrane receptors for angiotensin II, endothelin-1 and adrenaline (epinephrine) to the cardiac hypertrophy response. Protein NIX is part of the apoptotic response that explains how pressure induced hypertrophy can turn to heart failure. It is strikingly induced in Gq-dependent and pressure overload hypertrophy and, when expressed in vitro, localises to mitochondria and causes rapid cell death with caspase-3 activation and apoptotic nuclear changes. Expressed in the in vivo mouse heart, NIX provoked a dilated cardiomyopathy that was invariably lethal because of massive cardiomyocyte apoptosis within days of detectable protein expression.

▲ **Yussman MG**, Toyokawa T, Odley A, Lynch RA, Wu G, Colbert MC, Aronow BJ, Lorenz JN, Dorn II GW. Mitochondrial death protein NIX is induced in hypertrophy and triggers apoptotic cardiomyopathy. *Nature Med* 2002;**8**:725–30.

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American Journal of Medicine; American Journal of Physiology: Heart and Circulatory Physiology; Annals of Emergency Medicine; Annals of Thoracic Surgery; Archives of Internal Medicine; BMJ; Chest; European Journal of Cardiothoracic Surgery; Lancet; JAMA; Journal of Clinical Investigation; Journal of Diabetes and its Complications; Journal of Immunology; Journal of Thoracic and Cardiovascular Surgery; Nature Medicine; New England Journal of Medicine; Pharmacoeconomics; Thorax

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G Nichol, F McAlister, B Pham, A Laupacis, B Shea, M Green, A Tang, G Wells
June 2002;**87**:535–43. (Cardiovascular medicine)

8 Joint British recommendations on prevention of coronary heart disease in clinical practice
December 1998;**80**(suppl 2):S1–29.

9 Development and structure of the atrial septum
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