Circadian variation of left ventricular diastolic function in healthy people

SIR,—In their study of healthy people, Voutilainen et al found a nocturnal decrease and a daytime increase in the rate of left ventricular relaxation, which they tentatively attributed to sympathoadrenal activity.1 Neurobiological features are suggested by reports that link dysregulation of brainstem and cardiovascular control and cardiovascular reactivity in challenging tasks with dopamine abnormalities lateralised to the right hemisphere. This hypothesis is supported by the importance of dopamine in the control of wakefulness manifested by a reduction of reaction time and gap frequency, optimal response organisation at intermediate dopamine tone in a medial-frontal-stratial activation system, and inhibition of the right hemisphere promoting left-hemisphere dominance associated with cardiac arrhythmia and vasoconstrictions.2,3

These observations prompted a multidisciplinary approach involving neuropharmacology and cardiovascular physiology4 in evaluation of the pathophysiological importance of diurnal changes and the time course of speech induced ischaemia.5 This method was supported by the correlation of the frequency and duration of speech hesitations with a sixfold increase in the prevalence and incidence of coronary heart disease and mood, respectively, which reflect properties of neuronal activity and firing, and by the correlation of anxiety with the sixfold increase in fatal coronary heart disease, in particular, sudden cardiac death. It is also supported by the reduction in blood pressure associated with longer, less recurrent pauses6 that is predictive of a response to neuropharmacological intervention,7 and by the association of pause rate and variability in pause duration with the left and right hemisphere, respectively.8,9 hence the need to tailor interventions to asymmetrical brain functions.

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Effect of percutaneous fenestration of the atrial septum on protein-losing enteropathy after the Fontan operation

SIR,—We read with interest the paper by Mertens et al.1 They reported that in patients who had experienced a clinical result after Fontan operation, fenestration of the intratrial septum should be considered before proceeding to Fontan take-down or heart transplantation.

We recently treated a boy with hypoplastic left heart syndrome who had had a Norwood operation as a neonate and hemi-Fontan operation at the age of six months. The Fontan (TCPC) operation was completed when he was one year old and he was discharged on 57th postoperative day. The patient was doing well at home for a month, before he returned to hospital with right heart failure. An intra-atrial venous route was created by using 10 mm Gore-tex graft. Right heart failure progressed to protein-losing enteropathy which was resistant to medical treatment and finally we decided to construct a percutaneous fenestration of the interatrial septum made with a Gore-tex graft. A 6 French long sheath was introduced into the intra-atrial venous chamber from internal carotid vein, a Brockenbrough needle was introduced through the long sheath. A Blalock-Park blade catheter and 10 mm balloon catheter were introduced and a 10 mm diameter hole was made. Low cardiac output improved immediately. Transhephageal echocardiography immediately after the procedure showed a 7 mm diameter hole with significant right-to-left shunt in the Gore-tex baffle. The patient looked well and ascites and pleural effusion decreased. However, the pleural effusion and ascites gradually returned within three weeks. Because he showed clinical signs of severe low cardiac output we decided on a Fontan take-down 41 days after the transcatheter fenestration. The patient died from multi-organ failure three days after the take-down operation. At operation we found that the fenestration in the Gore-tex graft had closed. The Gore-tex graft had thickened up to 2 mm and the hole was completely closed and covered by endocardium.

Mertens et al1 reported successful treatment of a patient whose native interatrial septum was fenestrated by means of a Brockenbrough needle. Our case suggested that early closure of the fenestrated hole in the Gore-tex baffle is likely.

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This letter was shown to the authors, who reply as follows:

SIR,—We read with interest the case described by Satomi et al in which they confirmed the effectiveness of a secondary fenestration as a treatment for protein-losing enteropathy (PLE) after Fontan operation. We share their experience of seeing a significant haemodynamic and clinical improvement in patients immediately after the fenestration was created immediately after the procedure. Experience with cases we are aware of in other centres where this technique has been applied, Satomi et al observed a strong ten-dency for the procedure to close. The three fenestrations we created in Fontan patients, all became considerably
Coronary Palmsch-Schatz stent implantation in acute myocardial infarction

Sir,—Neumann et al are to be applauded for reporting that coronary stenting is an effective safe adjunct to direct percutaneous transluminal coronary angioplasty (PTCA) for acute myocardial infarction.1 This finding is of major importance and will have far-reaching implications. Their pilot study clearly lacks power to assess the clinical impact of pre-existing target vessel thrombus on reocclusion. It is, however, residual thrombus after balloon PTCA (seen in 36% of their cases) that gives greater concern. Moreover, without coronary ultrasound or angiography, it may sometimes be difficult to determine whether such residual thrombus is due to covert dissection, intimal disruption, or is a reflection of a high thrombogenic milieu despite seemingly optimum dilatation and flow. When the latter is thought to apply, we are naturally hesitant to stent, even though we would routinely use adjunctive intra-aortic balloon counterpulsation to optimise coronary perfusion.2 Like others, we sometimes resort to a period of intracoronary thrombolysis using an infusion catheter, but the results are unpredictable.3 In our experience, the most thrombogenic patients tend to be those undergoing not primary PTCA but rescue PTCA, particularly if they seem to be resistant to several doses of intravenous thrombolysis which may have induced a procoagulant state.4 It remains to be seen whether the platelet glycoprotein IIb/IIIa receptor antibody (c7E3 Fab) will have a major role in this difficult situation.

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This letter was shown to the authors, who reply as follows:

Sir,—As Dr Lim and Dr Norell correctly point out, coronary thrombus after balloon PTCA is a problem, particularly when a stent is thought to be needed. Clearly, our study does not have sufficient power to disprove their suggestion that residual thrombus before stent implantation increases the risk of subsequent stent thrombosis in acute myocardial infarction. In fact, the trend we found points towards an increased risk. Nevertheless, our data show that stenting in the presence of residual thrombus does not carry a prohibitive risk of subacute stent thrombosis. Even with the help of coronary ultrasound it may be difficult to distinguish between a primarily thrombogenic milieu and intimal disruption as the major mechanism for coronary thrombus formation. Our findings suggest that a coronary stent should be implanted in any case if needed and, although we cannot provide hard data to support our recommendation, we believe that adjunctive antplatelet therapy should be given. We agree with Lim and Norell that the newly developed platelet glycoprotein IIb/IIIa receptor antagonists deserve serious consideration for this purpose.

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Significance of perfusion of the infarct related coronary artery for susceptibility to ventricular tachyarrhythmias in patients with previous myocardial infarction

Sir,—Huikuri et al highlighted a very important aspect of current cardiology—that is, risk assessment for sudden death after a myocardial infarction (MD).1 The quest for a single test with a high predictive power has been the holy grail of cardiology for the past 10 years. The risk factors assessed so far, including reduced heart rate variability, baroreceptor sensitivity, signal-averaged electrocardiogram (ECG) and, electrocardiography, are poor predictors when used alone but were additive in combination. Farrell et al found that heart rate variability and signal averaged ECG offered the best combination in sensitivity and specificity.2 Even in this "high risk" group between 70% to 85% of patients will be event-free over several years of follow up, hence the need for a single test with a high predictive power.

The study of Huikuri et al implies that revascularisation of the infarct related artery will reduce ventricular arrhythmias. However, we are not told of the number of previous infarctions in the groups or whether a ventricular aneurysm was present: revascularisation would only be considered in susceptible ventricular tachycardias (VT) in the presence of a large myocardial scar (O'Rourke).3 Although the time elapsed after myocardial infarction is comparable in Huikuri et al's two patient groups, samples are skewed and the use of the median and non-parametric tests might have shown that the groups were not comparable. The emphasis placed on electrophysiological studies is not justified because most studies suggest that this is a poor predictor of sudden death in uncomplicated infarctions. Kowey et al in a meta-analysis found no difference in arrhythmic events between those who had inducible VT and those who did not.4 Vatterott et al showed that the best predictor of left potential on a signal averaged ECG was a closed artery; the next best predictor was a previous MI.5 This reduction in the number of left potential could also be achieved by angioplasty with the balloon inflated to 10—15—that is, beyond the period of myocardial salvage.6 Hohnloser et al showed that this benefit translates into event-free survival.7 In the study patients underwent revascularisation if they had objective evidence of ischaemia. The most powerful predictors of arrhythmias were a closed artery, left ventricular dysfunction, and diabetes. In other words, therapy is to be anticipated long before these three risk factors were summed they had a positive predictive power of only 50%. Undertaking coronary angiography and revascularisation has tremendous implications for costs and benefit. A better cost benefit approach may be to use a less sensitive test but treat those at risk with amiodarone. This is the basis of the eagerly awaited European and Canadian trials.

Effect of percutaneous fenestration of the atrial septum on protein-losing enteropathy after the Fontan operation.

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