References

[1] Boddeke E, Hugtenburg J, Jap W *et al*. New anti-ischaemic drugs: cytoprotective action with no primary haemodynamic effects. Trend Pharm Sci 1981; 10: 397–40.

[2] Stanley WC, Lopaschuk CD, Nail JL *et al*. Regulation of myocardial carbohydrate metabolism under normal and ischaemic conditions. Cardiovasc Res 1997; 33: 243–57.

[3] Detry JM, Seiller P, Pennafortes *et al*. Trimetazidine: a new concept in the treatment of angina. Comparison with propanolol in patients with stable angina. Br J Clin Pharmacol 1994; 37: 279–88.

[4] Manchanda SC, Krisimaswami S. Combination treatment with trimetazidine and diltiazem in stable angina pectoris. Heart 1997; 78: 363–7.

[5] Michaelides AP, Spiropoulos K, Dimopoules K *et al*. Antianginal efficacy of the combination of trimetazidine-propanolol compared with isosorbide dinitrate-propanolol in patients with stable angina. Clin Drug Invest 1997; 13: 8–14.

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ACE inhibitor use in heart failure: would that it were so

See page 1182 for the article to which this Editorial refers

The paper by Bart *et al*.[1] published in this issue addresses a clinically important issue. It is well recognised that despite overwhelming evidence confirming the efficacy of ACE inhibitors on both morbidity and survival in heart failure, these agents are seriously under-used. Most studies indicate that this is due to a false perception, especially among primary care physicians, that the drugs may be difficult to use in practice; the fears usually expressed concern symptomatic hypotension and renal dysfunction[2]. Only a small percentage of this under-usage can be explained by real intolerance to ACE inhibitors, i.e. cough. Bart *et al*. attempt to quantify the use of ACE inhibitors in contemporary, hospital-based management of patients with heart failure. The authors conclude that use of ACE inhibitors is considerably higher than previously reported (80%) and that the most common reason for not using these agents is perceived intolerance (9%).

This conclusion is a most welcome development and suggests that clinical practice in this field is finally interpreting the evidence appropriately. However, although this analysis of the Study of Patients Intolerant to Converting Enzyme Inhibitors (SPICE) registry is clearly of value, there are some major limitations. The reader must view these results critically in that the impact of the methodological flaws in data collection may be substantial and not easily quantified. The good news is that the database is very large (9580 patients) and the cohort is precisely defined. Patients' records were reviewed from 105 centres in eight countries evenly distributed between North America and Europe relatively recently (between August 1996 and April 1997). All patients had an estimated ejection fraction <35%, 26% were women and the aetiology was coronary artery disease in 63% of patients. There are some useful observations regarding the use of drugs in relation to clinical features, especially the frequent use of aspirin (62%) and the infrequent use of calcium antagonists (17%) and antiarrhythmics (17%) in patients with ischaemic heart disease. It is also interesting that advanced age, female sex, ischaemic aetiology, higher creatinine and North American origin were independent predictors of not being treated with an ACE inhibitor. Surprisingly, systolic blood pressure and serum sodium had no independent predictive value.

A serious source of bias results from the limitation that the information was collected by hospital physicians who participate in clinical trials. This is clearly not representative of usual practice in the participating countries. A randomly selected group of all eligible hospitals in a prospective trial would have been a far preferable design. Another major limitation concerns the method by which these 100 retrospective and 'consecutive' cases were ascertained at individual centres. No specific instructions or strategy were required; patients were identified arbitrarily from hospital records of inpatients, outpatients or from other registries such as cardiac catheterization or nuclear imaging laboratories.

Investigator bias may well have been important in that this registry was established in order to identify patients considered intolerant to ACE inhibitors who would represent potential candidates for participation in an efficacy trial with the angiotensin II antagonist candesartan. Investigators were motivated by an opportunity to participate in a clinical trial. Although the authors argue that this bias would tend

to underestimate that use of ACE inhibitors, the SPICE registry was organised to identify ACE-intolerant patients and test the feasibility of the planned trial. Therefore, investigators would not under-report ACE intolerance but might wish to demonstrate that their centre otherwise prescribed ACE inhibitors in all indicated patients. Another source of substantial selection bias that may explain the high percentage of treated patients is the fact that all patients in the registry had the presence of left ventricular dysfunction confirmed (EF<35%), i.e. ACE inhibitors were clearly indicated. This is an artificial situation and impacts on the applicability of these results to the general population with heart failure.

These limitations must lead us to conclude that the design of this registry is not appropriate for accurately describing contemporary management patterns. It is equally difficult for the authors to make any reliable estimate of error in the reported data. This may well explain the marked discrepancy between the findings reported in this paper and those of the relatively recent publications cited in the reference list that also evaluated hospital practice in the post-SOLVD era and indicate restricted use of ACE inhibitors[3]. Appropriate conservatism dictates that the reader finds the results reported here as encouraging, but of limited applicability. The routine management of heart failure may be improving, but it would be premature to relax our efforts.

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References

[1] Bart B, Ertl G, Held P *et al.* Contemporary management of patients with left ventricular systolic dysfunction: results from the Study of Patients Intolerant to Converting Enzyme Inhibitors (SPICE) Registry. Eur Heart J 1999; 20: 1182–90.
[2] McColl A, Roderick P, Gabbay J, Smith H, Moore M. Performance indicators for primary care groups: an evidence based approach. BMJ 1998; 317: 1354–60.
[3] Philbin E, Andreou C, Rocco T, Lynch L, Baker S. Patterns of angiotensin converting enzyme inhibitor use in congestive heart failure in two community hospitals. Am J Cardiol 1996; 77: 832–8.

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QT dispersion after myocardial infarction with heart failure: additional prognostic marker?

See page 1158 for the article to which this Editorial refers

The QT interval varies significantly between the 12 leads of the surface ECG. A potential clinical application of this interlead difference was proposed in 1990 by Day and co-workers[1], who suggested that this difference in QT duration may provide an index of the inhomogeneity of the repolarization, which they called 'QT dispersion'. QT dispersion then is the difference between the maximum and minimum QT across the 12-lead ECG, while QT_c dispersion is this value corrected for heart rate. The method has gained popularity owing to the advantages of its being simple to perform, its inexpensiveness, and the accessibility of the body surface electrocardiogram.

Increasing evidence suggests that the presence and degree of interlead QT variability, far from being a recording artifact, may provide clinically valuable information by reflecting underlying disturbances of ventricular recovery. Although the cellular basis for QT dispersion is incompletely understood[2], measurement of dispersion of repolarization has gained interest since the finding in animal studies that increased basic dispersion lowers the ventricular fibrillation threshold and facilitates induction of re-entrant arrhythmias[3]. Also, in humans, alterations in primary repolarization properties have been associated with an increased risk of sustained ventricular tachycardia. Subsequently, QT dispersion has been shown to be a meaningful clinical index for identifying patients at risk.

In recent years, probably because of the need for new and accessible markers of ventricular arrhythmogenicity, growing interest in the measurement of QT dispersion has been reflected in the literature. An association has been reported between prolongation of QT dispersion and the following: sudden death in chronic congestive heart failure, hypertrophic cardiomyopathy with serious ventricular arrhythmias or