of 35%. Repeat coronary angiography before discharge showed a patent LAD coronary artery.

Fitzpatrick et al suggest that the improvement in rhythm control and haemodynamic status seen after IABP insertion was due to spontaneous re-opening of the infarct-related vessel. Our observations confirm that patency of the infarct-related vessel may be associated with arrhythmia control. There have been no randomised trials of the value of such re-wiring intervention in such circumstances. Nevertheless, it is clear that restoration of vessel patency by intracoronary thrombolysis, with or without angioplasty, may be a life-saving intervention in acute myocardial infarction complicated by ventricular arrhythmias despite appropriate drug therapy.

M HARGRAVES
K CHANNON
O ORMEROD
Cardiology Department,
John Radcliffe Hospital,
Headington, Oxford OX3 9DU

Lack of rebound during intermittent transdermal treatment with glyceryl trinitrate in patients with stable angina on background β blocker

SrEM—Holdright et al in presenting their evidence of lack of rebound during intermittent transdermal treatment with glyceryl trinitrate in patients with stable angina on background β blocker (British Heart Journal 1993;69:223-7) unfortunately lost one important limitation of their study. The rebound effect described in previous studies was in the exercise test in the morning after the patch had been removed the previous evening, or as an increase in numbers of attacks in the evening after removal of the patch worn during the day. In the daytime, patients generally spend their time upright and walking around, activities resulting in greater sympathetic activation and more hydrostatic pressure in the lower extremities than when the patch is worn at night when patients rest supine in this time and are subject to low sympathetic activation. Parker et al showed that intermittent daytime patch administration of glyceryl trinitrate in young healthy volunteers was associated with increased plasma catecholamines, plasma renin, and anti-natriuretic hormone. Such a mechanism may also operate in elderly patients, particularly as increasing age seems to be related to an increasing reactivity to glyceryl trinitrate.

Though Holdright et al’s explanation that background β blocker treatment was responsible for the absence of the rebound effect is quite plausible, it remains unproven until the same type of study has been performed with daytime application of the glyceryl trinitrate patch.

GUNNAR NYBERG
Department of Medicine,
Ostra Hospital, Göteborg
and Clinical Pharmacology,
Astra Hälsé,
Malmö, Sweden


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

SrEM—Dr Nyberg raises an interesting point about the mechanism of rebound associated with intermittent nitrate therapy. It is plausible that patch application at night resulted in less neurohumoral activation than would have occurred with daytime therapy. However, as we originally stated, we based the study design on the known circadian pattern of angina in order to maximise the likelihood of detecting rebound after patch removal. Exercise tests were performed in the morning to coincide with the well-recognised morning peak of ischaemia. The benefits of such a schedule have to be weighed against the possibility that nocturnal patch application produces less sympathetic activity than daytime therapy. However, neurohumoral activation is only one mechanism that could be responsible for the rebound phenomenon. Other mechanisms that are independent of the timing of patch application include sulphhydryl depletion, desensitisation of soluble guanylate cyclase, and plasma volume shifts related to altered capillary pressure. Such a mechanism may also operate in elderly patients, particularly as increasing age seems to be related to an increasing reactivity to glyceryl trinitrate.

D R HOLDRIGHT
R J KATZ
C A WRIGHT
J L SPARROW
A K SULLIVAN
K M FOX
Royal Brompton National Heart and Lung Hospital,
Sydney Street,
London SW3 6NP


Is there such a thing as normal sinus rate?

SrEM—Although in his viewpoint Professor Meijler wrestled with the perpetually belaboured concept of "normal", he began: "The currently accepted limits for a normal (sic) sinus rate were set at 60 and 100 beats per minute by Kossman in 1953. These limits were set long before in 1953 in consecutive editions of the New York Heart Association’s Nomenclature and Criteria in 1928 for ‘regular sinus rhythm’ and subsequently in the 4th (1943) edition and thereafter for ‘normal sinus rhythm’ at least partly because 60 beats per minute represents exactly five 200 ms boxes on ECG paper and 100 beats per minute represents three 200 ms boxes. Kossman clearly described these limits as being chosen ‘for convenience and for uniformity of designation.’ In any event, in our paper we were not concerned with electrocardiography, but rather with clinical and epidemiological appropriateness.

Professor Meijler referred to Murphy’s seven definitions of normal. In a reply to the single letter of critical of our work, he has already cited Murphy and has emphasised that our proposal of “normal” was as an operative definition in Murphy’s series. Lack of “acceptable” (as noted by Professor Meijler). MyOLE (PAL not medical) and I understood that under conditions other than resting daytime ones individuals could indeed have sinus heart rates that are normal, though beyond both base metabolic (resting) limits that we proposed, as, for example, during sleep or during the range of physical activity. Moreover, if our paper were regarded as a re-definition of sinus tachycardia and bradycardia, the word “normal” could have been omitted from the title with no loss of message.

Professor Meijler challenging our study group (500 patients) as perhaps not being “sufficiently large and appropriately stratified healthy sample”. However, as we reported, our results accord with the results in the 5000 patients reported by the Framingham Heart Study.

On the basis of past contributions Professor Meijler’s views deserve respectful attention. However, in a survey (136 distinguished members of the American College of Cardiology (many of them Professor Meijler’s peers) over 90% agreed with the operational rate limits of 50 to 90 beats per minute with only two votes for the status quo and with the remainder supporting different variants.

Professor Meijler refers to the increased cardiovascular mortality predicted by increased resting heart rates and asks “How important is the difference in mortality between patients with heart rate of 90 and 100?” The answer awaits an appropriately designed and executed randomised controlled trial. Without formal investigation underlay the traditional 60 to 100 beats per minute range. Why then does Professor Meijler prefer this range to ours, which is based on the results of an appropriately designed study and are consistent with Framingham and EPICORE data? Indeed, so few subjects had rates between 90 and 100 beats per minute that there may, indeed, be a critical difference in that range.

In his last sentence Professor Meijler offers a truism—that is, trivial changes in “normal” boundaries irrespective of statistical significance may not reflect biological significance. He is correct. Success in the operational sequence about “accepted limits” tacitly agrees that there can be conventional (“accepted”) normal limits. In Professor Meijler’s hospital do reports of “normal” (computed or other) use “normal sinus rhythm” for regular sinus rhythms between 60 and 100 beats per minute and “sinus tachycardia” and “sinus bradycardia” for faster and slower rates?

Terminology greatly influences thought patterns, because “linguistic usage shapes
Lack of rebound during intermittent transdermal treatment with glyceryl trinitrate in patients with stable angina on background beta blocker.

G Nyberg

Br Heart J 1993 70: 486
doi: 10.1136/hrt.70.5.486

Updated information and services can be found at:
http://heart.bmj.com/content/70/5/486.1.citation

These include:

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/