Matters arising

A mean duration of epilepsy of 19. Interpretation of these figures is also made difficult by there being a marked skew deviation to the distribution: of all the subgroups the highest median total number of seizures was 26.

John Duncan
Institute of Neurology, Queen Square, London WC1N 3BG, UK

References


Callaghan replies:

The suggested therapeutic range of 40-80 μmol/l for phenytoin1 2 is still widely used in clinical practice, although there is evidence that newly diagnosed patients, in particular those with a low seizure frequency prior to treatment can be controlled with serum levels less than the recommended therapeutic range.3 4 We had hoped that our findings would help to clarify the false interpretation of the therapeutic range for phenytoin, which sometimes results in unnecessary upward dose adjustments of the drug in order to achieve a level within this range, when some patients can be adequately controlled with lower doses.

While we did not give details of the range of levels associated with excellent or good control in our paper, improved seizure control on phenytoin was associated with a wide range of serum levels, from 5-60 μmol/l for patients with generalised seizures and 6-50 μmol/l for patients with partial seizures. (In patients without improvement the serum levels ranged from 50-140 μmol/l.)

It is correct that anticonvulsant drug levels were assessed in the afternoon which enabled us to evaluate peak rather than trough levels. We found an overall range of levels associated with excellent or good control for carbamazepine, between 5-42 μmol/l for patients with generalised seizures and 10-42 μmol/l for patients with partial seizures. We feel it is unlikely that a further increase in drug levels to 50 μmol/l would have resulted in a significant further improvement. In fact, patients with poor control had a range of levels between 30-65 μmol/l. We do agree however, that some patients might have improved further if the dose of the drug had been increased to the limits of the patient’s tolerance.

It is not implied in our article that a 50% reduction in seizure frequency was regarded as a good response or satisfactory outcome. A good response was regarded as a greater than 50% reduction in seizure frequency. (Thus, patients in this category had a reduction in seizure frequency within the range of greater than 50% and less than 100% seizure control.) Patients with a 50% reduction in seizure frequency or less were regarded as poor responders.

Clarification of table 7 is required. In this table the seizure frequency per unit time was not presented but rather the “total number of seizures prior to treatment” as with table 1 and table 4. The duration of seizures is presented as duration in the months prior to treatment.

The Kruskal Wallis analysis of variance is a non parametric test and does not require a normal distribution of data. We do agree that the data are considerably skewed, reflecting the variability of the seizure disorder between patients.

Finally, a mean seizure frequency per month can be calculated by dividing the total number of seizures by the mean duration of epilepsy prior to treatment. Thus, the mean seizure frequency per month for patients with excellent control was 3-1; good control 3-2 and poor control 6-7.

References


Thermal discrimination thresholds in normal subjects and in patients with diabetic neuropathy

Sir: We were most interested to read the report of Bertelmsmann et al5 on thermal sensitivity. There are, however, a number of points of principle and methodology which we would wish to raise, as we feel they have a bearing on the validity of their conclusions.

The thermal discrimination threshold, as described by the authors, is compounded of both heat and cold thresholds.1 Reports in the literature indicate the individuality of these sensations, their receptors and fibre pathways2-4. In our own studies5 we have found that heat and cold thresholds frequently vary independently and unpredictably (Jamal et al, unpublished observations), such that their combination in a single measurement is unlikely to produce an accurately quantified index of thermal sensitivity.

All of the patients studied appear to have had a clinically severe neuropathy with concomitant abnormalities on conventional electrophysiology. In terms of assessing the sensitivity of their method, it would have been informative if applied to patients with minimal, perhaps only subjective, evidence of neuropathy and no abnormality on conventional electrophysiology.

In techniques of this nature standardisation is of paramount importance. We were unhappy about Bertelmsmann et al’s technique in this context on three counts:

1. There has been no attempt to standardise the temperature of the skin to which the thermal stimulus is applied. Ambient skin temperature at the time of application of the thermal stimulus is known to influence the value obtained for that threshold.5-8 In our experience, diabetic patients as a group have a more variable and lower skin temperature than normal subjects.

2. We have, in the past, investigated the method of standardisation of “pressure” adopted by Bertelmsmann et al and found that the variation was pronounced. We, therefore, wonder whether this manual/spring assisted application of the thermode can be reproducibly quantified.

3. It would appear from the description of their method that two stimuli are applied to the skin more or less simultaneously. There is a tactile stimulus (when the thermode is applied to the skin) and the specific thermal stimulus. It is particularly important, however, for the accurate assessment of thermo-sensitivity that as pure a stimulus as possible is used and that the specific stimulus is applied without tactile cues.6 9 10

We feel that these are pertinent criticisms.
of the technique and may, in part, account for the large intra-individual variability of the results that the authors have found on repeated determinations.

GORAN A JAMAL ANDREW I WEIR JOHN P BALLANTYNE
Glasgow University Department of Neurology
Institute of Neurological Sciences Southern General Hospital
Glasgow G51 4TF, UK
STIG HANSEN
Department of Clinical Physics and Bio-engineering
West of Scotland Health Boards
Glasgow, UK

References

Bertelsmann et al reply

Thank you for allowing us to reply to the comment of Dr Jamal. Although there are differences in cold and warm perception, detailed morphological studies of cold and warm receptors and fibre pathways are still lacking.1,2 Moreover there is no proof that neuropathy affects cold and warm perception separately. It is generally accepted that both cold and warm perception is conducted by thin myelinated and unmyelinated nerve fibres.1,2 With our equipment we are able to investigate cold and warm sense separately but this procedure is time consuming and gives information on the same type of nerve fibres. Therefore we determine a cold-warm index: thermal discrimination threshold. We agree with Dr Jamal that it is worth exploring this theme.

The topic of our article was to present a method to investigate thermal cutaneous sensation in normal subjects and in patients with diabetic neuropathy.3 In other studies we investigated different groups of diabetics to assess the sensitivity of our method.4,5 We found that a group of diabetics without complaints of neuropathy had a significantly increased thermal discrimination threshold in comparison with healthy volunteers.4,5 Because thermal perception is related to the temperature of the skin, skin temperature is included in our test procedure.

At the beginning of the test, skin temperature is measured and the first stimulator is set and maintained at this temperature. The temperature difference is adjusted and thus the temperature of the second stimulator is always related to the temperature of the first stimulator. It is our experience that after the subject is acclimatised in the examination room skin temperature does not change during the test.

Although on theoretical grounds a pure thermal stimulus is preferred, this manner of stimulation has some practical limitations.3 Using a spring mechanism application pressure of the stimulators is reproducible. We agree with Dr Jamal that automated application of the stimulators would be ideal.

In our opinion technical modifications would not result in a smaller variability of thermal discrimination thresholds. It has been argued elsewhere that the main part of variation in sensory thresholds is caused by central processing factors.6

References

Simulated paraplegia: an occasional problem for the neurosurgeon

Sirs: In their recent article on simulated paraplegia RS Maurice-Williams and H Mabbott stress that an important criterion for the diagnosis is the demonstration of inconsistency. At the bedside one may note the absence of sphincter problems, and either normal reflexes and a non-anatomical distribution of sensory changes. Nurses may note movement when the patient is unaware of being observed.

An objective test of spinal cord function independent of the patient's co-operation is to record somatosensory evoked potentials from the scalp following stimulation of the level of the lesion,2 the posterior tibial nerve at the ankle being a useful site. A normal response obtained from someone claiming loss of feeling is a very important inconsistency. The somatosensory evoked potential tests the dorsal column, medial lemniscal system only and therefore is normal in pure spino-thalamic sensory loss. Pain and temperature loss with normal touch and pressure sense is not a pattern one sees simulated though it may become so if patients become more knowledgeable.

Another physiological test which may be of value, though I have no experience with it, is simulated paraplegia, is stimulation of the motor cortex. A muscle twitch after stimulation gives an estimate of cortico-spinal tract function and conduction velocity.3 Simulated paraplegia is an obvious indication for the use of a non-invasive and objective test of spinal cord function which can aid diagnosis. Somatosensory evoked potentials is one such test and is now widely available and should be used.

EM SEDGWICK
Wessex Neurological Centre
Southampton General Hospital
Southampton SO9 4XY, UK