
respectively but stabilised after 75-83 minutes, with heat flow from the chest stable at about twice resting level. Heat flow from the hand increased after 55 minutes, but only slightly. Metabolic rate, with the subject lying down and relaxed, was 49-8 W/m². This rose to 199-2 W/m² 30-35 minutes after the start of immersion and to 301-1 W/m² at 60-65 minutes. The last value implied whole body insulation of approximately 0-102 W/m²°C.

Comment

This subject’s account suggests that he had maintained near normal body temperature while swimming for many hours in water at 5-6°C. In the experimental simulation his temperature stabilised after 75 minutes, with clothing giving only slight thermal protection. His metabolic rate and insulation were then similar to those of fat subjects (mean subcutaneous fat thickness 7-8 mm) of earlier experiments exercising in water at 9-12°C, but after 30 minutes in water at 5°C those subjects, unlike him, showed pronounced increases in peripheral heat loss and progressive body cooling as cold vasodilatation developed. Absence of this in our subject may have been due to his greater fat thickness. Cold vasodilatation is associated with cold paralysis of blood vessels of the extremities, flow then being controlled by more proximal, better insulated arteries. Thicker subcutaneous fat increases that insulation.

We are greatly indebted to the subject for his cooperation. The study was supported by an MRC grant.

What does “virtually unable to walk” mean?

Mobility allowance may be awarded to a disabled person aged between 5 and 65 years if he is unable or “virtually” unable to walk. Everyone understands inability to walk but there is no agreement on what constitutes “virtual” inability to walk. It is difficult to quantify gait in a clinically useful way (though it influences decisions in some cases), but I report a study of the other parameters of mobility (distance, time, and speed) mentioned in the mobility allowance regulations.

Patients, methods, and results

I studied 46 men and 29 women who had been awarded a mobility allowance within the preceding year because they were “virtually unable to walk.” Thirty-four of the subjects (aged 20-60 years; average 45 years) were studied in 1977-8 and 41 (20-64 years; average 48) in 1983-4 (the age limit for mobility allowance was increased from 60 to 65 in that time). Thirty-six subjects suffered from neurological disorders (stroke in 15, multiple sclerosis in nine), 21 suffered from musculoskeletal conditions (arthritis in 10), seven were lower limb amputees, and five had congenital abnormalities, three cardiac disorders, and three miscellaneous disorders. Their mobility was assessed by asking them to walk at their normal pace on the flat for 12 minutes or until they felt restricted by pain, breathlessness, or tiredness. Distance covered and time taken to first stop or distance covered in 12 minutes were noted and speed to that point calculated.

Three subjects could walk for only one minute, while 28 walked for 12 minutes; the average time was 7-7 minutes and the median duration 8-0 minutes. The chart plots the distances and speeds. The average distance walked was 174 m and the average speed 24 m/min. Only 27 subjects were below the median values (lines A in the chart) for distance (120 m) and speed (20 m/min). Twenty-three subjects were in the middle category between lines A and B (the upper quartile values for distance (240 m) and speed (34 m/min)). A further 12 were in the outer category between lines B and C, which is the junction of the upper eighth and lower seven eighths for distance (360 m) and speed (43 m/min). There was no difference among major diagnostic groups or between the 1977-8 and 1983-4 samples.

Comment

“Virtually unable to walk” may be a satisfactory legal term but clinically it is almost meaningless. Guidance notes make it clear that no one factor (such as
as distance) is decisive despite the regulations, which are couched as a series of alternatives. Decisions are made by lay officers interpreting a medical report which pays insufficient attention to assessment of mobility. This study therefore measured not only aspects of the mobility of holders of the allowance but also the collective opinions of a group of assessors. The results should interest organisations representing disabled people.

Most subjects walked more than the 100 m quoted in cases turned down on appeal. They were, however, studied under less stressful and more representative conditions than when being examined for the mobility allowance. The wide scatter of results confirms the variability of assessments and the need to rationalise the system for making the award. It is impossible to set a limiting value for any parameter but the likelihood of an applicant being successful increases as distance, speed, and time of walking decrease. I have therefore suggested three categories bounded by distances (120 m, 240 m, and 360 m) and speeds (20 m/min, 34 m/min, and 43 m/min) which might be the basis of a points system. Other parameters of mobility—for example, energy expenditure—would also have to be considered and weighted.

The Department of Health and Social Security should commission an independent evaluation of methods of assessing mobility, which would make an independent check on the mobility allowance more objective and thereby reduce criticism of this allowance and examining doctors.


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### Treatment of chronic painful diabetic neuropathy with intravenous lidocaine infusion

Treatment of painful diabetic neuropathy is still a major clinical problem.1,2 Two uncontrolled studies showed that intravenous lidocaine infusion was beneficial for this treatment of painful diabetic and non-diabetic neuropathy.3,4 In a randomised, double blind crossover study we investigated the effect of intravenous lidocaine infusion on the symptoms and signs of painful diabetic neuropathy.

### Subjects, methods, and results

We included 20 patients in the investigation, but five dropped out because of compliance or personal problems. The remaining 15 patients (six women, nine men; median age 47 years, range 26-65) had had moderate or severe symmetrically painful diabetic neuropathy for from six months to 20 years (median three years). They all had more than one of the following symptoms: dull aching or lancinating pain, cutaneous dysesthesia, numbness and tingling paraesthesia, nightly exacerbation of symptoms, and disturbed sleep.1 None of the patients suffered from alcohol abuse, cohabitation (vitamin B12) deficiency, uremia, cardiac or hepatic dysfunction, intermittent claudication, or infections. All patients gave informed consent, and the investigation was approved by the local ethical committee.

With an interval of five weeks the patients randomly received intravenous infusion of lidocaine (5 mg/kg body weight) and isotonic sodium chloride (1 ml/kg body weight) over 30 minutes under continuous electrocardiographic monitoring. No side effects were noted. The patients did not use analgesics during the investigation.

The symptoms and signs of neuropathy were evaluated immediately before and after, the day after, and once weekly for five weeks after each infusion. A five item symptom score scale was used: pain, dysesthesia, paraesthesia, nightly exacerbation, and disturbed sleep were each graded as absent (0), mild (1), moderate (2), or severe (3). From three days before and during the entire investigation the patients registered twice daily their degree of pain on a graphic visual analogue rating scale graded 0-100 mm. To consider only the significant relief of pain with lidocaine and to reduce the influence of daily variation, the score for pain was calculated every three days, and only a reduction in score greater than 15 mm after infusion was considered to be an improvement. Serum lidocaine concentration and its metabolite monoethylglycinexylidide were determined at the end of each infusion. Statistical analyses were performed using Wilcoxon's test for paired differences, McNemar's test, and Spearman's rank correlation test.

<table>
<thead>
<tr>
<th>Lidocaine infusion</th>
<th>Placebo infusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before treatment</td>
<td>12 (3-15)</td>
</tr>
<tr>
<td>Day 1</td>
<td>3* (0-15)</td>
</tr>
<tr>
<td>Day 2</td>
<td>22 (2-15)</td>
</tr>
<tr>
<td>Day 15</td>
<td>12 (5-15)</td>
</tr>
</tbody>
</table>

*p<0.05; **p<0.02; ***p<0.01.

With the five item symptom score scale, lidocaine relieved symptoms significantly more effectively than the placebo one and eight days after infusion (p<0.05 and p<0.02, respectively) (Table). In the 11 subjects who responded the effect of lidocaine lasted 3-21 days. With the visual analogue rating scale, 11 subjects showed reduced pain the first three days after lidocaine compared with four after the placebo (p<0.05).

Blood glucose, glycosylated haemoglobin, and body weight were identical immediately before the two infusions. There was no significant correlation between the reduction in symptoms or pain and the serum lidocaine and monoethylglycinexylidide, blood glucose, and glycosylated haemoglobin concentrations. Lidocaine had no significant influence on plantar, ankle, or knee reflexes, sensibility for touch and pain, sense of position, stereognosis, the vibration threshold at the big toe, heat to beat variation in heart rate during deep breathing, or response to postural blood pressure.

### Comment

Treatment of painful diabetic neuropathy is a clinical problem and often disappointing. We found that intravenous lidocaine infusion significantly relieved symptoms in 11 of 15 patients with long term, painful diabetic neuropathy. An improvement in metabolic regulation cannot explain the findings.1,2 Lidocaine might relieve symptoms, as in cardiac arrhythmias, by disconnecting abnormal nervous impulse circuits.

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### Correction

Clinical diagnosis of intracranial haemorrhage using Guy’s Hospital score

We regret that there was an omission in this article by Dr P A G Sandercoc et al (14 December 1985, p 1675). In the fifth paragraph of the Patients and methods, on the diagnostic score for each patient, apoplectic onset should have been defined by the presence of any two of loss of consciousness at onset, headache within two hours, neck stiffness, and vomiting within six hours.