Having variations of hours with this activity to take outpatients situation to have Assessing impairment, to a this contribution.

Nevertheless, it is understandable because by choosing to study patients with parkinsonism rather than essential tremor other factors, namely bradykinesia, rigidity, and postural instability, would have influenced any measures obtained by an assessment of handicap or disability.

One factor that we have studied and consider to be critical in determining the impact of tremor upon upper limb function is "tremor suppressability", namely, the extent to which tremor amplitude can be suppressed while performing manual tasks and the period of time that this suppression can be maintained by the patient (the coefficients of amplitude and temporal suppression respectively).* This point was nicely illustrated by Jager and King who describe a man with marked hereditary essential tremor who could nonetheless shoot deer with a rifle at a hundred yards. Any method that solely examines tremor-occurrence rate cannot account for variations in tremor suppressability nor the functional consequences of different types of tremor (for example rest, postural, and intention tremors).

Finally, Boose et al appear to have shown that patients are reliable witnesses, a fact that will be of great comfort to the humble and hard-pressed clinician.

Bain and Findley reply: We note the findings of Boose et al with considerable interest. Their technique of recording parkinsonian tremor for prolonged periods of time (up to 10 hours) and their use of "tremor-occurrence rate" as an index of tremor severity prove a useful insight into the problems involved in assessing tremor severity. We agree entirely about the advantages of assessing patients during their normal activities rather than in an artificial laboratory environment, where patients may (at least initially) be unduly tense and anxious. Their point about diurnal variation of tremor is also well made, and in the case of parkinsonian tremor we have observed that further short-term fluctuations occur from burst to burst in EMG recordings and can be seen from minute to minute and hour to hour in patients' limbs (phenomena that led us to speculate that parkinsonian tremor may be a fractal process). We do, however, have some reservations about their approach. Firstly, the equipment is costly and not widely available. Secondly, the time involved in recording and analysing tremor recordings may preclude its routine clinical use except in specialist departments. Thirdly, their measurement of tremor-occurrence rate was compared with a six-point clinical rating scale and a five-point patient self-ratingscale, which are both clearly measures of impairment. These scales are not functional measures of disability or handicap in a conventional sense. Boose et al do not appear to have assessed disability formally. This is understandable because by choosing to study patients with parkinsonism rather than essential tremor other factors, namely bradykinesia, rigidity, and postural instability, would have influenced any measures obtained by an assessment of handicap or disability.

One factor that we have studied and consider to be critical in determining the impact of tremor upon upper limb function is "tremor suppressability", namely, the extent to which tremor amplitude can be suppressed while performing manual tasks and the period of time that this suppression can be maintained by the patient (the coefficients of amplitude and temporal suppression respectively).* This point was nicely illustrated by Jager and King who describe a man with marked hereditary essential tremor who could nonetheless shoot deer with a rifle at a hundred yards. Any method that solely examines tremor-occurrence rate cannot account for variations in tremor suppressability nor the functional consequences of different types of tremor (for example rest, postural, and intention tremors).

Finally, Boose et al appear to have shown that patients are reliable witnesses, a fact that will be of great comfort to the humble and hard-pressed clinician.

Correspondence to: Dr. Boose


NOTICES

The Xllth International Congress of Neuropathology will be held in Toronto, Ontario, Canada from 18–23 September 1994. This meeting will be conjoint with the American Association of Neuropathologists Annual Meeting and the Canadian Association of Neuropathologists Annual Meeting. For further information please contact Dr J J Gilbert, Victoria Hospital Research Institute, 375 South

shift from ocular to generalised myasthenia gravis was a more common feature of anti-AChR antibodies-positive myasthenia gravis (14 of 28 patients, 50%) than that of seronegative myasthenia gravis (one of five patients, 20%). Subsequent to a follow-up period of more than one year, the group of anti-AChR antibodies-negative patients consisted of four (3%) ocular cases and 10 (7%) generalised cases. Consequently, I am unable to confirm Toyka's observation of only 45% anti-AChR antibodies-positive cases in long-standing ocular myasthenia gravis. Toyka also suggests that cases with questionable myasthenia gravis may have been included in the analysis of generalised myasthenia gravis resulting in lower estimates of the sensitivity relating to such cases. This is a very unlikely explanation in view of the scrutiny of all cases including clinical assessment by an experienced examiner, all of which is thoroughly expounded in my article¹ and also in my epidemiological study.²

FE SOMMIER
Department of Neurology, Righighospitalet, Blagdansvej 9, DK-2100, Copenhagen, Denmark

1 Sommier FE. Clinical implementation of anti-saccharosyl acceptor antibodies. J Neurol Neurosurg Psychiatry 1993;56:496-504.

Assessing tremor severity with long-term tremor recordings

We have read the paper by Bain et al with great interest. This excellent work will be of considerable benefit for future studies. Nevertheless we would like to draw attention to a fact that has been underestimated in this contribution. In their study of tremor-occurrence rate they have evaluated the validity of a clinical rating scale and of short-term, upper-limb accelerometry by comparing the results to various measures of functional impairment, clearly demonstrating the superiority of the rating procedure over the neurophysiological approach. On the basis of our own results it seems most likely that of the main reasons for the weak validity coefficient in their study is the short duration of the recordings, which do not take into account the marked diurnal variations of tremor severity, and the exceptional situation in a clinic laboratory.

In order to overcome these problems which are a general feature of short-term tremor quantification, we have developed a method for measuring tremor for up to 24 hours by recording the EMG of wrist extensors and flexors with a small portable tape recorder. During the recording period the outpatients are free to move around and maintain their usual activities, allowing us to measure exactly that involuntary muscle activity which produces the daily living impairment. Having gained some experience with this technique, we appreciate such long-term recordings as a reliable tool for clinical studies. Moreover, our measure of tremor severity (which actually is the tremor-occurrence rate) seems to correlate better with a patient's self-rating of functional impairment than the doctor's clinical assessment.

We have investigated this issue in a preliminary manner by evaluating treatment effects in 15 parkinsonian patients with different premedications. The tremor severity was assessed before and after the change in medication, firstly by rating on a six-point scale, and secondly by a 1-hour tremor recording. In addition, the patients were asked to rate the effect on a scale consisting of five grades: marked improvement (2), slight improvement (1), no change (0), slight deterioration (1), and marked deterioration (3). When the changes in tremor occurrence rate and clinical rating, and the patient's self-rating are correlated, the coefficients (Spearman’s r) and p values are: doctor's rating—self-rating: r = 0.25, p = 0.37; doctor's rating—long-term EMG: r = 0.017, p = 0.95; self-rating—long-term EMG: r = 0.860, p < 0.001.

Although our setup is not directly comparable to the one used by Bain et al (we studied parkinsonian patients instead of patients with essential tremor), furthermore, EMG and accelerometry might differ in their correlation with functional impairment of tremor our data allow the following conclusion: neurophysiological techniques do have a place in tremor quantification if they are applied for sufficiently long periods of observation. When used in this way, they not only avoid the abovementioned problems, but most importantly, the correlation with functional impairment seems to be higher than in any short-term method, including clinical rating.

ANDREAS BOOSE SYBBILE SPEIKER CHRISTOPH JENTGENS THOMAS RICKGEBER ERICH SCHOLZ JOHANNES DICHGANS University of Tubingen, Department of Neurology, Hoppe-Seyler-Strasse 2, 72076 Tubingen, Germany

Correspondence to: Dr. Boose


Technological developments take about 20 years to reach the marketplace. The first functional implantary spinal stimulator was used in 1960 but why haven’t we got useable products to restore motor function after spinal cord injury or stroke? This book will inform you, not that it sets out to answer the above question, but it is a comprehensive state-of-the-art review with 15 chapters and 20 contributors.

There is a comprehensive review of models of muscle activity but muscle models do not feature much in the work of designers and engineers of functional electrical stimulation (FES) systems. Possibly this is because models are designed to predict muscle activity in limited laboratory situations and over strictly limited ranges and speeds of movement. Controlled lengthening features very little in models but is an important function of muscle in movement.

As soon as engineers realised that a contracting muscle normally feeds back information about itself and its joints, they began to implement various feedbacks into FES systems with improved results. Feedback however means sensors. A review of mechanical sensors concludes that developments in flexible microelectronic devices made from polymers with arrays of silicon chips will perhaps provide a sensory glove to operate with hand control FES. There is, however, an alternative strategy.

Quadraplegics and hemiplegics have intact skin sensors so why not try to tap into their signals in the peripheral nerves? This is technically feasible and a consideration of the practicality of it in man appears in Chapter 5.

This leads to another fundamental debate that runs through several chapters—should stimulating electrodes be implanted and what should be their design? There is no doubt that implantation is safe and reasonably reliable but will it always work? It works well enough for cardiac pacing and as root stimulation for micturition but hand function requires such a variety of different loci and degrees of stimulation that getting every aspect to function well becomes a superhuman effort.

Walking should be easier to control than the many different hand functions. Multichannel stimulation to produce stepping movements has been unkindly called "electronic puppetry". The devices that seem to work are cruder and simpler than the designs to which engineers aspire. There are hybrid devices of mixed mechanical and electrical function and the simple peroneal nerve stimulator for footdrop. Both these operate close to the limit of patient "gadget tolerance". Most other devices are well above this threshold and only used by the patient when the doctor or engineer insists.

The final chapter on the transfer of technical, neuromuscular stimulator designs gives a useful insight into how corporations develop, manufacture and market devices. Some fascinating "case histories" are given and the legal framework within which one must operate is set out. The authors are from the North American Continent. What will strike the British reader is how few of the right conditions exist in Britain. This type of research requires very close working relationships between engineers, physiologists and clinicians. Which of our Universities or Trust Hospitals has the facility for this?

This is a very nicely produced book. The editors have done well to cover the field in breadth and depth. It seems that the really juicy prize of FES making significant advances in Alzheimer’s disease is almost within our grasp but, like Tantalus, we realise it is still just out of reach.

EM SEDGWICK


This book contains brief chapters based on presentations at the Third International Conference on Alzheimer’s Disease and related disorders held in Padua in July 1992. The 73 brief chapters are arranged in sections ranging from basic biochemical defects in Alzheimer’s disease to care giving for the patient and family. As a report of an international meeting this book inevitably seeks to cover a large number of topics, none of them very deeply. Nevertheless, all the major researchers in the Alzheimer field have contributed in one form or another and certain sections including those on mechanisms of cell death and genetic factors are interesting and stimulating. One of these is a section by Cotman et al on neuronal death in Alzheimer’s disease which discusses the possible contribution of apoptosis to neurodegenerative disorders. There is some evidence that β amyloid may not only enhance the susceptibility to apoptosis as well as necrosis but also enhance the cells’ vulnerability to glutamate induced toxicity. This concept of multifactorial causation of cell death in Alzheimer’s disease is likely to be paralleled in other neurodegenerative disorders, such as Parkinson’s disease. Another valuable contribution is the review by Stanley Prusiner on prion disease.

Are published transactions of meetings useful? At best they are a fairly rapidly published series of brief chapter reviews providing relatively up-to-date information, focused usually on a high number of related topics. At worst, they are a vehicle for publication of some rather questionable data in a number of short and superficial articles. Overall, this book tends more towards the former model. It will provide a useful summary of a variety of topics, many of which will be of use to the researcher. This is not a book for those looking for a succinct and comprehensive review.

AHY SCHAPIRA


This multi-author book is written for “emergency room physicians, non-neurologists and intensivists” who look after acutely ill neurological patients. The editor, who has written an excellent chapter on acute stroke, points out the direction the management of neurological problems is taking. More elective investigations are being undertaken on an out-patient basis so that now there is an increasing need for the provision of care often in an intensive care unit, for the acutely ill neurological patient. Perhaps in the future such patients will be managed by a multi-disciplinary team.

The book covers a number of common clinical problems: epilepsy and status, neuromuscular emergencies, brain death, head injuries, infections, intracranial pressure and cerebral resuscitation—to name some. Like many multi-author works some topics appear better covered. I found the chapters on head injuries and neuromuscular emergencies very helpful, but spinal cord problems are only discussed following acute injury. Surely an acute myelitis or vascular cord lesion deserves mention. There is no discussion of encephalitis or of acute demyelination. The last may affect the brain stem acutely with life-threatening bulbar problems. I found the section on metabolic disturbances patchy but enjoyed the chapter on difficult behaviour. Some useful charts are used but surprisingly only two diagrams and four pictures (two of apparatus and two scans showing spinal injuries). The text is written for an American reader: this is clear in the discussion on the withdrawal of life support. There are useful comments about the role of the EEG and evoked potentials to monitor patients with brain damage.

Overall this book succeeds. It is easy to read, it contains a wealth of helpful information and the price is modest so that its intended readers should benefit from its purchase. I recommend it.

T FOWLER

Short Notices
