ANNOUNCEMENT

The Volvo Awards for Low Back Pain Research 1993

In order to encourage research in low back pain, the Volvo Foundation in Stockholm, Sweden, also this year has sponsored three prizes of USD 9,000 each. Awards will be made competitively on the basis of scientific merit in one or more of the following areas:

1. Clinical studies
2. Basic/Experimental studies
3. Studies in other basic science areas

Papers submitted for the contest must contain original material, not previously published or submitted for publication. A multiple authorship is acceptable. The manuscripts, in the English language, should be in the form of a complete report, including original illustrations (please note: marked with numerals) and not exceeding 30 typewritten pages - references and tables included; double-spaced; typed text should not be smaller than 10 points; and in a form suitable for submission as an original paper (not thesis) to a scientific journal. One original and 5 copies of each paper in full - including illustrations - must reach the address given below not later than December 31, 1993. Accordingly, articles sent by fax will not be accepted. Do not forget to give complete address with telephone number and Fax number.

One of the authors must be prepared, at his own expense, to come to Marseilles, France, at the time of the 12th Meeting of the International Society for the Study of the Lumbar Spine, June 15-19, 1993, to present the paper and to receive the award.

The board of referees will be chaired by the undersigned and will contain members from the fields of clinical medicine, biochemistry, and psychology.

Please direct all correspondence to:

Professor Alf Malmstrom
Department of Orthopaedics
 Sahlgrens Hospital
S-413 45 Göteborg, Sweden

BOOK REVIEW


Psychosomatic stress is recognized as an important contributory factor to physical disease. Links between emotional states, neuroendocrine control systems and cardiovascular function have been investigated since Cannon's classic studies in the 1920s, and those by Selye in the 1930s. Friedman & Rosenman's concept of type A behaviour in the early 1960s helped us to identify a new risk factor for coronary heart disease. This book gives a review of the major mechanism of stress and the role of the hypothalamic-pituitary-adrenal system and modifications in the stress-induced responses of the body. The chapters are well written and are supported by a comprehensive bibliography.

The book is recommended.


BODYS WEIGHT-BEARING WHILE RISING AND SITTING DOWN IN PATIENTS WITH STROKE

Margareta Engard1,2,3 and Elisabeth Olsson2

From the Departments of Physical Therapy, Orthopaedics and Clinical Neurophysiology, Karolinska Institutet, Stockholm, Sweden

ABSTRACT. Distribution of body weight on the two legs while rising and sitting down was examined in 42 stroke patients and 16 healthy adults during both spontaneous movement and following instruction directed to even weight distribution. Vertical floor reaction forces were measured by two force plates. There was a difference between patients and controls in the tested motor tasks - the patients favoured their non-affected leg. However, body weight distribution was less symmetric when patients tried to rise and sit down evenly compared to spontaneous rising/sitting down (p < 0.001). Patients' own estimation of distribution of body weight documented on a visual analogue scale, correlated with actual body weight distribution while rising (r = 0.36) but not while sitting down. To motivate stroke patients to pay attention to their ability to distribute body weight evenly while rising and sitting down and to create and use adequate self-reports seems to be necessary commitment in a rehabilitation programme in order to avoid the learned nonuse syndrome.

Key words: Stroke, body weight-bearing, asymmetry, vertical floor reaction force, rising, sitting down, self-report, visual analogue scale.

To be able to rise from a seated position and to sit down again is a prerequisite for self-reliant locomotion and for many activities of daily living. Clinical experience would suggest that body weight is distributed unevenly on both lower extremities in healthy subjects but unevenly in patients with stroke during rising and sitting down (2, 6). The function test Motor Assessment Scale for Stroke (8) demands even body weight-bearing to score full recovery in rising from sitting. During recovery from stroke when the patient becomes able to stand up and to sit down from standing, body weight-bearing on the paretic leg is spontaneously avoided. If neglected, this pattern might become a habit and the patient will develop the learned nonuse syndrome (23). Several studies on normal rising, involving kinematics (16, 19, 21, 22), kinetics (9, 15, 21) and muscle activity (12, 14, 20) have been performed. Few (1, 3, 5, 24) have been directed towards activity patterns relating to rising and sitting down in stroke patients.

The purposes of this study were to (a) determine the movement time and body weight-bearing under each foot in stroke patients in the acute phase of recovery during rising and sitting down habitually as well as after instruction directed at even body weight distribution on the two legs and (b) evaluate the patients' own estimation of body weight distribution on the two legs.

SUBJECTS AND METHODS

The criteria for the selection of patients were (1) a hemiparesis secondary to a cerebrovascular disorder (infarction or haemorrhage) in either hemisphere, (2) in the acute phase of recovery (i.e., within a time period of one week and three months after the incidence), (3) that they could understand and follow instructions and (4) could stand up and sit down independently. Patients with normal motor function in the lower extremities or who showed ataxia when standing up were excluded. The group included 42 stroke patients, 26 men and 16 women. They were all in-patients from rehabilitation departments in Stockholm. Table I shows the medical characteristics of the stroke patients.

For comparison 16 age-matched healthy adults with no symptoms from the lower extremities volunteered to participate in the study. Table II summarizes the characteristics of the patients and the control group.

Two vertical strain-gage force transducers attached to force measuring platforms were used (7) for examination of the vertical floor reaction forces, one under each foot. The recordings from the force transducers were analyzed by a specially designed computer program, called K-Raie. The time integral of vertical force under each foot was measured. These impulses were shown graphically as areas in a force-time curve, as in Fig. 1. or numerically as the product of mean vertical force and time (Nm).

The two variables thus measured by K-Raie were the movement time and the impulses of each foot during rising and sitting down, respectively. Body weight distribution was computed as the weight load ratio of the paretic and non-
The reproducibility of the tests of vertical floor reaction forces during rising and sitting down "habitually" were analysed in 16 healthy volunteers. They performed the rising and sitting down tasks on five different occasions in the morning, after 10 min. in the afternoon, after 1 week and after 2 months. The coefficient of variation, as computed from the results of the five different tests, was 6.8% for rising and 8.5% for sitting down. The reliability of the examiner's accuracy on the judgment of start and end of rising and sitting down was evaluated against a motion analysis system (E.L.T.E.-Elaboratory Illuminare Television, B.S., Bioengineering Technology & Systems, Via Cerecentes, 66- 20168 Milano, Italy). Reflective markers were attached to the heel and the patella of the subjects and to the remote switch held by the examiner. Recordings of linear displacements anterior-posteriorly were done and compared with recordings from the examiner's switch during 15 transfers of rising and sitting down in one patient and in one healthy volunteer (Table III). The time difference between the displacements of the heel and patella respectively, and the switch was within the range of 0-15 ms after the start of the patients' rising and sitting down in the range of 0-375 ms before the end of the patients' rising and sitting down. These systematic differences, when connecting and disconnecting the measurement of time, were considered negligible as the movement time for the stroke patients was within the range of 2.3-6.9 s (mean 3.7) in rising and 2.3-6.2 s (mean 4.0) in sitting down.

The study was approved by the Karolinska Hospital Ethics Committee.

RESULTS

Time needed to rise

When the subjects were instructed to rise "habitually" the mean time needed was 3.7 s in the patients and 2.3 s in the control group (p<0.001). When the subjects were instructed to rise "easily" the mean time needed was 3.8 s and 2.9 s, respectively (p<0.001), as shown in Fig. 2. When rising after two different instructions, "habitually" and "easily", the difference in movement time was significant only in the control group (p<0.01), i.e., the control group needed a longer time when performing "easily", as shown in Fig. 3.

Time needed to sit down

When the subjects were instructed to sit down "habitually" the mean time needed was 4.0 s in the patients and 2.5 s in the control group (p<0.001). When the subjects were instructed to sit down "easily" the mean time needed was 4.0 s and 3.0 s, respectively (p<0.001), as shown in Fig. 2. When sitting down after two different instructions, "habitually" and "easily" the difference in movement time was significant only in the control group (p<0.01), i.e., the control group needed a longer time when performing "easily", as shown in Fig. 3.

Body weight distribution in rising

The body weight distribution ratio after instruction to rise "habitually" was 0.60 in the patients and 0.99 in the control group (p<0.001), equivalent to 37.5% body weight borne on the patellar leg and 49.7% body weight borne on the right leg. When the subjects were instructed to rise "easily" the ratio was 0.80 (44.4% body weight) and 0.97 (49.2% body weight), respectively (p<0.001), as shown in Fig. 4. When rising
The reproducibility of the tests of vertical floor reaction forces during rising and sitting down "habitually" were analyzed in 16 healthy volunteers. They performed the rising and sitting down transits on five different occasions: in the morning, after 10 min. in the afternoon, after 1 week and after 2 months. The mean of the four different tests, was 6.8% for rising and 8.5% for sitting down. The reliability of the examiner's accuracy on the judgment of start and end of rising and sitting down was evaluated against a motion analysis system (ELITE-Elaboratory Illuminante Television, BTS, BioEngineering Technology & Systems, Via Capriati, 46-20148 Milano, Italy). Reflective markers were attached to the head and the pelvis of the subjects and to the remote switch held by the examiner. Recordings of linear displacements anterior-posteriorly were done and compared with recordings from the examiner's switch during 15 transits of rising and sitting down in one patient and in one healthy volunteer (Table III). The time difference between the displacements of the head and pelvis respectively, and the switch was within the range of 0-15 ms after start of the patients' rising and sitting down (in the range of 0-375 ms before the end of the patients' rising and sitting down. These systematic differences, when concatenating and disconnecting the measurement time, were considered negligible as the movement time for the stroke patients was within the range of 23.6-6.9 s (mean 3.7) in rising and 23.6-6.2 s (mean 4.0) in sitting down.

Table III. Difference in milliseconds between the examiner's judgement of start and end of the movements and the recordings from the motion analysis system (ELITE-Elaboratory Illuminante Television, BTS, BioEngineering Technology & Systems, Via Capriati, 46-20148 Milano, Italy). Reflective markers were attached to the head and the pelvis of the subjects and to the remote switch held by the examiner. Recordings of linear displacements anterior-posteriorly were done and compared with recordings from the examiner's switch during 15 transits of rising and sitting down in one patient and in one healthy volunteer (Table III). The time difference between the displacements of the head and pelvis respectively, and the switch was within the range of 0-15 ms after start of the patients' rising and sitting down (in the range of 0-375 ms before the end of the patients' rising and sitting down. These systematic differences, when concatenating and disconnecting the measurement time, were considered negligible as the movement time for the stroke patients was within the range of 23.6-6.9 s (mean 3.7) in rising and 23.6-6.2 s (mean 4.0) in sitting down.

Table III. Difference in milliseconds between the examiner's judgement of start and end of the movements and the recordings from the motion analysis system (ELITE-Elaboratory Illuminante Television, BTS, BioEngineering Technology & Systems, Via Capriati, 46-20148 Milano, Italy). Reflective markers were attached to the head and the pelvis of the subjects and to the remote switch held by the examiner. Recordings of linear displacements anterior-posteriorly were done and compared with recordings from the examiner's switch during 15 transits of rising and sitting down in one patient and in one healthy volunteer (Table III). The time difference between the displacements of the head and pelvis respectively, and the switch was within the range of 0-15 ms after start of the patients' rising and sitting down (in the range of 0-375 ms before the end of the patients' rising and sitting down. These systematic differences, when concatenating and disconnecting the measurement time, were considered negligible as the movement time for the stroke patients was within the range of 23.6-6.9 s (mean 3.7) in rising and 23.6-6.2 s (mean 4.0) in sitting down.

The study was approved by the Karolinska Hospital Ethics Committee.

RESULTS

Time needed to rise

When the subjects were instructed to rise "habitually" the mean time needed was 3.7 s in the patients and 2.3 s in the control group (p<0.001). When the subjects were instructed to rise "evenly" the mean time needed was 3.8 s and 2.9 s, respectively (p<0.001), as shown in Fig. 2. When rising after two different instructions, "habitually" and "evenly", the difference in movement time was significant only in the control group (p<0.01), i.e., the control group needed a longer time when performing "evenly", as shown in Fig. 3.

Time needed to sit down

When the subjects were instructed to sit down "habitually" the mean time needed was 4.0 s in the patients and 2.5 s in the control group (p<0.001). When the subjects were instructed to sit down "evenly" the mean time needed was 4.0 s and 3.0 s, respectively (p<0.001), as shown in fig. 2. When sitting down after two different instructions, "habitually" and "evenly" the difference in movement time was significant only in the control group (p<0.01), i.e., the control group needed a longer time when performing "evenly", as shown in Fig. 3.

Body weight distribution in rising

The body weight distribution ratio after instruction to rise "habitually" was 0.60 in the patients and 0.99 in the control group (p<0.01), equivalent to 37.5% body weight borne on the parietic leg and 49.7% body weight born on the right leg. When the subjects were instructed to rise "evenly" the ratio was 0.80 (44.4% body weight) and 0.97 (49.2% body weight), respectively (p<0.001), as shown in Fig. 4. When rising...
after two different instructions, “habitually” and “evenly”, the difference in body weight distribution was significant only in the patients ($p<0.001$), i.e., the body weight distribution was less asymmetric rising “evenly”, as shown in Fig. 5.

Body weight distribution in sitting down
The body weight distribution ratio after instruction to sit down “habitually” was 0.61 (37.9% body weight) in the patients and 1.02 (50.5% body weight) in the control group ($p<0.001$). When the subjects were in-

![Graph](image)

Table IV. Correlations between degree of paresis/sensory function and movement time/body weight distribution during standing up and sitting down, habitually and evenly

<table>
<thead>
<tr>
<th></th>
<th>Time</th>
<th>Weight ratio</th>
<th>Weight ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Habitually</td>
<td>Evenly</td>
<td>Habitually</td>
</tr>
<tr>
<td>Motor function</td>
<td>up</td>
<td>down</td>
<td>up</td>
</tr>
<tr>
<td>Sensory function</td>
<td></td>
<td>0.33 0.38</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 3 Movement time while rising and sitting down after two different instructions in stroke patients ($n=42$) and control group ($n=16$). Mean and SE are given. I patients; II controls.

Fig. 4 Weight load ratio while rising ($p<0.001$) and sitting down ($p<0.001$) “habitually” and “evenly” in stroke patients ($n=42$) and a control group ($n=16$). Mean and SD are given. I patients; II controls.

![Graph](image)

Instructed to sit down “evenly” the ratio was 0.77 (43.5% body weight) and 1.04 (51% body weight), respectively ($p<0.001$), as shown in Fig. 4. When sitting down after two different instructions, “habitually” and “evenly”, the difference in body weight distribution was significant only in the patients ($p<0.001$), i.e., the body weight distribution was less asymmetric sitting down evenly, as shown in Fig. 5. Correlates performed to assess the influence of the patients’ degree of paresis and sensory function (10) on movement time and body weight distribution on the two legs are shown in Table IV.

**Patients’ own estimations**
The subjective estimations of even body weight-bearing documented on the visual analogue scale averaged 47 mm (SD 28.8) for rising, and 55 mm (SD 27.5) for sitting down. The frequency distribution of the different estimations is seen in Fig. 6. There was a correla-

**DISCUSSION**
Time to rise and to sit down
There was a difference in the time needed to rise and to sit down between the patients and the control group.

Table V. Correlations ($r$) between the patients’ estimation of body weight distribution on the two legs and actual body weight load ratio

<table>
<thead>
<tr>
<th>Method</th>
<th>$r$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standing up</td>
<td>0.36</td>
<td>0.022</td>
</tr>
<tr>
<td>Sitting down</td>
<td>0.17</td>
<td>0.291</td>
</tr>
</tbody>
</table>
after two different instructions, "habitually" and "evenly", the difference in body weight distribution was significant only in the patients (p<0.001), i.e., the body weight distribution was less asymmetric rising "evenly", as shown in Fig. 5.

Body weight distribution in sitting down
The body weight distribution ratio after instruction to sit down "habitually" was 0.61 (37.9% body weight) in the patients and 1.02 (50.5% body weight) in the control group (p<0.001). When the subjects were instructed to sit down "evenly" the ratio was 0.77 (43.5% body weight) and 1.04 (51% body weight), respectively (p<0.001), as shown in Fig. 4. When sitting down after two different instructions, "habitually" and "evenly", the difference in body weight distribution was significant only in the patients (p<0.001), i.e., the body weight distribution was less asymmetric sitting down evenly, as shown in Fig. 5. Correlations performed to assess the influence of the patients' degree of paresis and sensory function on movement time and body weight distribution on the two legs are shown in Table IV.

Patients' own estimations
The subjective estimations of even body weight-bearing documented on the visual analogue scale averaged 47 mm (SD 28.8) for rising, and 55 mm (SD 27.5) for sitting down. The frequency distribution of the different estimations is seen in Fig. 6. There was a correlation (r=0.36) between the patients' estimation of evenness in body weight distribution and actual body weight load ratio during rising, but none in sitting down, as shown in Table V.

DISCUSSION
Time to rise and to sit down
There was a difference in the time needed to rise and to sit down between the patients and the control group. Patients were slower to rise and sit down.

Table IV. Correlations between degree of paresis/sensory function and movement time/body weight distribution during standing up and sitting down, habitually and evenly

<table>
<thead>
<tr>
<th></th>
<th>Time Habitually</th>
<th>Weight ratio Habitually</th>
<th>Time Evenly</th>
<th>Weight ratio Evenly</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>sp</td>
<td>down</td>
<td>sp</td>
<td>down</td>
</tr>
<tr>
<td>Motor function</td>
<td>-0.33</td>
<td>0.38</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>Sensory function</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table V. Correlations (r) between the patients' estimation of body weight distribution on the two legs and actual body weight load ratio

<table>
<thead>
<tr>
<th></th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standing up</td>
<td>0.36</td>
<td>0.022</td>
</tr>
<tr>
<td>Sitting down</td>
<td>0.17</td>
<td>0.291</td>
</tr>
</tbody>
</table>
Fig. 6. Frequency of patients’ subjective estimation of evenness in body weight-bearing while rising and sitting down, documented on a visual analogue scale (VAS). (0 = no weight-bearing on the paretic leg, 100 = even body weight distribution on both legs).

No. of patients

VAS, rising

VAS, sitting down

100 80 60 40 20 0 0 20 40 60 80 100

Weight distribution in rising and sitting down

In the patient group the load on the paretic leg was 37.5% body weight, when the patients rose habitually.

In contrast, when the patients rose following instructions to bear body weight evenly, the weight load on the paretic leg was 44.4% body weight. When sitting down the load was 37.9 and 43.3% body weight, respectively.

Patients’ estimations

The visual analogue scale (VAS) has been recommended as a reliable assessment of pain intensity (4, 11). In our knowledge there is no study using the VAS for self-estimation of parameters other than that of pain. In this study the VAS was used to document the patients’ own opinion of body weight distribution on the two legs during rising and sitting down. There was a correlation, albeit low, between the patients’ own estimation of evenness of body weight distribution and actual body weight load ratio during rising but not during sitting down. This may indicate either that the patients were not properly instructed to use the scale, that the visual analogue scale might be too crude and too abstract to be adequate or that the patients were poorly aware of their body weight distribution when rising and not at all when sitting down. Stroke patients especially those with visual deficits may have physiological as well as spatial restraints to accurately document on a vertical or on a horizontal scale any kind of estimation. However, bearing in mind the importance of self-report in motor relearning (7), it is suggested that the use of a visual analogue scale carefully elaborated, or other types of reliable self-estimations might be appropriate in stroke patients in order to facilitate motivation and active participation in a rehabilitation programme, enhancing motor relearning.

ACKNOWLEDGEMENTS

The present investigation was supported by grants from the Swedish Education Policy Committee for Physiotherapy, the National Association for Health Caring Sciences, Karolinska Institute, Stockholm, Sweden.

REFERENCES

Fig. 6. Frequency of patients subjective estimation of even- ness in body weight-bearing while rising and sitting down, documented on a visual analogue scale (VAS). (9 = no group. The patients needed a longer time. This agrees with Yoshida et al. (24), who studied 20 healthy adults, 20 elderly persons and 10 hemiparetic pa- tients. They explained this through the patients lack of vigor and that the patients required a longer time to stabilise sway about the centre of force when rising. They also found that healthy elderly subjects needed more time than younger individuals to stabilise the antero-posterior sway during rising. This could ex- plain why the mean time (2.3 s) of rising for the control group in our study differs from Niazik et al. (16). They studied 35 healthy adults (mean age 26.4) and found that the average movement time for rising was 1.8 s (range 1.3–2.5 s). Pat & Rogers (18) have studied sit-to-stand transfer at self-selected fast and natural speeds in eight healthy subjects (30–38 years). The maximum oscillation in antero-posterior direc- tion when coming up to standing, was significantly greater (p <0.01) at fast speeds than at natural speeds, suggesting greater instability for the faster movement in sit-to-stand transfer. This may explain the de- creased velocity seen in our patients during rising. The patients, having just learnt how to rise, were not ready to expose themselves to speedy adjustments when coming up from a three point support to a two point support. They were not yet sufficiently stable to counteract antero-posterior body sway for balance control. There was no difference in time required for the patient group between rising and sitting down “habitually” and “easily”. In contrast there was a difference within the control group. This may add to the knowledge that rising is a movement under the control of an acquired automatism central program. The patients had not yet acquired an automatic en- gram and the control group, when trying to conce-}

**ACKNOWLEDGEMENTS**

The present investigation was supported by grants from the Education Policy Committee for Physiotherapy and Physiotherapy for Health Caring Sciences, Karolinska Institute, Stockholm, Sweden.

**REFERENCES**


DIAGNOSTIC BLOCKS OF THE TIBIAL NERVE IN SPASTIC HEMIPARESIS

Effects on Clinical, Electrophysiological and Gait Parameters


From the Department of Rehabilitation University Hospital Groningen, The Netherlands and the Department of Clinical Neurophysiology and Rehabilitation, Free University Hospital Amsterdam, The Netherlands

ABSTRACT. The value of a diagnostic block (DB) of the tibial nerve in 17 hemiparetic patients with gait disturbances was investigated. The purpose of this study was to find instruments that help to select patients who will benefit from a long lasting peripheral nerve block. The manually elicited ankle clonus and its abolition after injection of a local anaesthetic appeared to be a useful clinical test for the efficacy of DB. Electrophysiological tests proved valuable when DB failed to produce clinical effects. With a substantial number of blocked nerve fibres walking velocity did not deteriorate. Transient disturbances in sensation can be regarded as unwanted side effects that might adversely affect the walking ability. From the different aspects of gait an improve heelcontact demonstrated the functional gain in patients with a dynamic equinus foot. To differentiate between a dynamic equinus foot and fixed contractures, we recommend the use of a fast acting local anaesthetic for diagnostic nerve blocks.

Key words: hemiplegia, spasticity, peripheral nerve block, electrophysiology, gait.

Spasticity, defined as a velocity dependent stretch response (17), is often held responsible for a disturbed walking ability. Drug therapies, surgical procedures (chronotomies and neurotomies) or nerve blocks can effectively reduce hypertoniaresis and resistance to passive stretch. Young et al. (29) stated, however, that this reduction does not necessarily imply an improved function. This is mainly due to the complex nature of disintegration of the Central Nervous System which is also manifest in other symptoms like e.g. paresis, co-contractions, loss of dexterity and viscoelastic changes in affected muscles (8, 16).

The application of local anaesthetics to motor nerve fibres has been subject of investigation both in animal experiments (18, 23) and studies in man (8, 27). These studies demonstrate a preferential blocking of gamma efferents by weak (0.2%) procaine solutions which cause an extinction of the stretch reflex and the tendon jerk but without impairment of voluntary movement. These results have led to the common belief in an increased gamma-motoneuron discharge in spastic patients and to the clinical differentiation between alpha- and gamma-spasticity. By means of microelectrodes, Hagbarth et al. (9) and Burke et al. (5) were able to demonstrate that absence of fusimotor drive did not necessarily imply a decreased spindle sensitivity in some spastic patients. A central hyperexcitability to afferent (proprioceptive and cutaneous) inflow is thought to be responsible for the exaggerated dynamic stretch reflexes in patients with lesions of the cerebro-spinal pathways (5, 8). Reports on peripheral nerve blocks by percutaneously applied local anaesthetics as a diagnostic tool prior to longer lasting therapies are scanty and do not cover systematical investigations (4, 13, 15, 22, 26).

The purpose of this study was to look for discriminative parameters that could help to distinguish between patients that may or may not benefit from a non-selective tibial nerve block. In a prospective clinical trial we compared clinical, electrophysiological and walking parameters before and after an injection of bupivacain (0.5%) into the tibial nerve of patients with a spastic hemiparesis. The present study is part of a comprehensive research project into the efficacy of peripheral nerve blocks by means of radiofrequency (RF) heat lesions in the management of spasticity (1).

METHODS

Seventeen hemiplegic patients whose medical data are listed in Table I were selected for a diagnostic block (DB) of the tibial nerve in the spastic leg on the following criteria: