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Polyneuropathy is a syndrome with many different causes. Polynuropathies are typically characterised by distal sensory loss and diminished or lost tendon reflexes, with or without distal weakness and wasting, and affect the lower limbs before the upper limbs. When these patients are investigated, electrophysiological studies play a role initially in confirming the diagnosis and subsequently in directing the search for the cause. It is known that electrophysiological studies may be normal in patients with a history and clinical features suggestive of polyneuropathy. Possible explanations are that these patients have another (neurological) disease, the polyneuropathy is in an initial phase, or only small fibres are affected. We could not find any report in the literature on the prognosis of such patients. The prognosis is of interest since, if it is good, there is no need for repeated and further investigations. Therefore, we investigated the functional status in such patients at least 2 years after presentation. Moreover, we investigated whether finally an explanation for the signs and symptoms was found and whether the neurological examination at presentation predicted the functional status at follow up.

METHODS

Patients

We retrospectively analysed all patients with electrophysiological test results incompatible with polyneuropathy. All patients had been sent to the outpatient department by general practitioners suspecting a neurological disorder and had electrophysiological tests because neurologists considered the diagnosis might be polyneuropathy. The electrophysiological tests were conducted between 1993 and 1998.

Details of symptoms, signs, medical history, age, and gender were obtained from the medical records. Patients were not included if they had no symptoms and/or signs of a polyneuropathy. Symptoms could consist of: tingling, burning, electrical or band-like sensations, pain, numbness, a feeling of muscle weakness, cramps, muscle stiffness, and trembling sensations in muscles. Signs could consist of impaired vibration perception, impaired reaction to pin prick and temperature, reduction of joint position and cutaneous touch pressure, hyperpathy, muscle weakness, wasting, fasciculations, and loss of tendon reflexes. Impaired vibration perception on the great toe, loss of the ankle jerk reflexes, and atrophy of the digitorum brevis muscles were considered to be normal in patients older than 65 years of age.

In all patients, the diagnosis of small fibre neuropathy was considered. If clinical symptoms and signs were compatible with small fibre neuropathy, thermo-sensory threshold tests were performed. Electrophysiological studies were performed using standard techniques, including motor and sensory conduction velocities in at least one arm nerve and two leg nerves, F responses of the median nerve and peroneal nerve, H reflex of the soleus muscle, and electromyography of distal arm and leg muscles.

All included patients were interviewed at least 2 years after presentation. They were initially contacted by phone by a neurologist of the outpatient department where they had been investigated. The patient was included in the study after written informed consent. The study was approved by the ethics committee of our hospital after completion of the study.

Follow up

To investigate long term functional outcome, we scored the physical section of the Sickness Impact Profile (SIP) scale at least 2 years after presentation. The physical dimension of the SIP scale consists of three subscales which refer to (instrumental) disabilities in terms of body care and movement (23 items), walking (12 items), and mobility (10 items). Functional status at follow up.

Abbreviations: SIP, Sickness Impact Profile
Table 1  Patients with symptoms and/or signs suggestive of polyneuropathy, but without abnormalities on electrophysiological examination

<table>
<thead>
<tr>
<th>Only symptoms, no signs, n = 35</th>
<th>Symptoms and signs, n = 39</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female:Male</strong></td>
<td></td>
</tr>
<tr>
<td>Age (years), mean (range)</td>
<td></td>
</tr>
<tr>
<td>Good outcome on SIP</td>
<td></td>
</tr>
<tr>
<td>No diagnosis</td>
<td></td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
</tr>
<tr>
<td>Erythromelalgia</td>
<td></td>
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<tr>
<td>Ciguatera intoxication</td>
<td></td>
</tr>
<tr>
<td>Conversion</td>
<td></td>
</tr>
<tr>
<td>Lumbar canal stenosis (n = 9)</td>
<td></td>
</tr>
<tr>
<td>Multifocal sclerosis (n = 5)</td>
<td></td>
</tr>
<tr>
<td>Spinal dural arteriovenous fistula (n = 2)</td>
<td></td>
</tr>
<tr>
<td>Claudication intermitens</td>
<td></td>
</tr>
<tr>
<td>Distal spinal muscular atrophy</td>
<td></td>
</tr>
<tr>
<td>Meningioma C2</td>
<td></td>
</tr>
<tr>
<td>Plexopathy</td>
<td></td>
</tr>
<tr>
<td>Radiculopathy</td>
<td></td>
</tr>
<tr>
<td>Intramedular tumour</td>
<td></td>
</tr>
<tr>
<td>Syringomyelia</td>
<td></td>
</tr>
<tr>
<td>Vitamin B12 deficiency</td>
<td></td>
</tr>
</tbody>
</table>

**Possible small fibre neuropathy**

<table>
<thead>
<tr>
<th>Co-morbidity</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes mellitus (DM)</td>
<td>3</td>
</tr>
<tr>
<td>Alcoholism</td>
<td>3</td>
</tr>
<tr>
<td>Renal disorders</td>
<td>1</td>
</tr>
</tbody>
</table>

*Frequency.

DISCUSSION

Our results show that in more than 60% of patients who present with objective signs at neurological examination, but without electrophysiological tests confirming polyneuropathy, a diagnosis can be established after at least 2 years of follow up. In contrast, less than 10% of patients without neurological signs finally had a diagnosis.

Almost two thirds of all included patients finally had no diagnosis. Of these patients, 11 probably had small fibre neuropathy.

In some patients with diabetes, alcohol abuse, or renal insufficiency we could not establish any diagnosis; these
patients had neither polyneuropathy nor small fibre neuropathy.

Almost all the patients without signs at neurological examination had a good outcome. In the group of patients with neurological signs, more than one third had a poor outcome. The outcome in patients with neurological signs depends on the final diagnosis. In almost half of the patients with neurological signs in whom finally a diagnosis could be established, the outcome was poor. We are unable to compare our results with those of other centres since follow up data of similar groups of patients have not been published.

We conclude that in patients who present with symptoms of polyneuropathy but who have neither neurological signs nor electrophysiological studies confirming a polyneuropathy, further investigations are not indicated, except for patients fulfilling the criteria for small fibre neuropathy. In patients with neurological signs, but without electrophysiological evidence of polyneuropathy, follow up visits and further investigations are mandatory to establish a diagnosis as they may have a treatable disorder.

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Competing interests: none declared

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