pigian carcinoma invading the thyroid and the right wall of the trachea. He was treated with ablation of the right thyroid lobe, tracheotomy, and three courses of chemotherapy (CCDP, 5FU) followed by radiation therapy (50 Gy and upper mediastinum (45 Gy) with a 20 Gy dose on the sub-gloccic area. The calculated total radiation dose received on the spinal cord was 48 Gy at the C6 level (maximal dose at 2 cm high on the spinal cord region) and 42 Gy at the cervical region (including C7) and 41 Gy for T1. There was no development of the mass on regular CT scans. The only treatment was thyroid hormones after surgery.

Three years after finishing radiation therapy and after transient parasthesia of the hands and a Lhermite sign (lasting less than two weeks), the patient developed progressive wasting and weakness of both hands and forearm extensors. He had no symptoms in the legs nor sphincter disturbance. We found no sensory abnormality (except a questionable reduction of tactile perception on the inner distal hand) nor motor dysfunction, and tendon reflexes were present except supinator and triceps jerks on both sides. Neurological examination elsewhere was normal including touch.

Electromyographic examination showed fibrillation, giant potentials and some fasciculations in right and left hand muscles, and reduced recruitment in forearm extensors. The shape of the arm muscles and the arms of the face and legs were normal. Motor conduction velocities, distal motor latencies, and amplitude of sensory potentials were normal in all limbs. Values of somatosensory evoked potentials were in the normal range after median and posterior tibial stimulation. Haematological, biochemical, and hepatic routine tests, thyroid hormones, lipogram, sphyllithic serology, viral serologies, serum and urine lead concentrations were normal. Cerebrospinal fluid was normal for cellular count, biochemistry and protein electrophoresis.

Cervical MRI was performed five months after therapy and had not previously been described. All reports of delayed lower motor neuron syndrome have not previously been described. All reports of delayed lower motor neuron syndrome after radiation concern the legs, generally after irradiation for lymphomas or testicular malignant tumours. These motor neuron syndromes usually present as a progressive weakness of the legs without sensory or sphincter disturbance. Development stops after some months or years and so far the prognosis is better than in other forms of myelopathy. Signs suggestive of a cervical anterior horn involvement (muscle wasting, fasciculations, tendon reflex loss) have been mentioned in some cases but they were associated with corticospinal and long sensory tract lesions (mainly Brown-Sequard syndrome). The pathogenesis of radiation myelopathies remains controversial, but vascular changes are almost constant and are considered as the primary damage rather than neuronal or immunological disorders. As the grey matter is classically considered less vulnerable to radiation than white matter, the anterior horn is presumed to be less or not involved, although in several anatomical cases of radiation myelopathies an extension of lesions towards the anterior horns has been reported. There are no well documented anatomical reports of motor neuron syndromes after radiation and some controversy exists as to the site of lesions (anterior horn, motor neuron roots, or plexus), but clinical and electrophysiological data from most cases suggest an involvement of the anterior horns. If we know of only one report of MRI data from a patient with motor neuron syndrome of the legs and the thoracic spinal cord, images were normal. In a case reported by Lechevalier et al a patient had Brown-Sequard syndrome after radiation with proximal wasting and weakness of the left arm. Histological examination of the cervical spinal cord showed a centrospherical necrosis with complete neuronal loss of the left anterior horn. Perhaps in our case the spinal cavity on MRI was secondary to necrosis involving the cervical anterior horns.

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The incidence of muscle cramp

In true muscle cramp there is sudden involuntary and painful shortening of muscle and visible or palpable knotting of muscle often with abnormal posture of the affected joint which is relieved by stretching or massage. Electrical and clinical data on muscle cramp are sparse and based upon empiricism. Wilder in 1940 found that 19% of young soldiers, 33% of workers in a silk mill, and 67% of medical staff who had experienced muscle cramp. The incidence in groups of internal, neurological, and psychiatric patients was 40%. In a study in 1947 of 100 men and 100 women aged 15-80 years, Hall found that 56% had suffered from cramp; of those aged 50 years or more, 70% had suffered. Of 121 college students questioned in 1956, Norris found that 115 had experienced spontaneous muscle cramp at least once, 18

Figure Sagittal T1 weighted SE (500 ms/15 ms) image showing cystic hypointense cavity affecting spinal cord from C4 to C6 without ectopic tonsils. Note fatty replacement of cervical spine bone marrow from C2 to C6, responsible for hyperintense on T1 weighted images.
Muscle cramp is difficult to diagnose in a community survey. The criteria we used, however, were not always clearly defined. The proportion of the adult population of The Netherlands that had at least a single muscle cramp in 1988 was estimated at 36%. This high incidence agrees with empirical data from previous studies. Occurrence of cramp may thus be considered as nothing unusual in otherwise healthy adults. Age adjusted incidence ratios showed a 3.2 female preponderance, which was not accounted for by pregnancy associated muscle cramp, as women beyond childbearing age were particularly affected (table). Age had little effect on the proportion of the population suffering. Nevertheless, older people suffering from cramp had attacks more often than younger people (data not shown). At any age, muscles in calves (84%) and feet (39%) were most often affected. Men showed a slight tendency for cramp in calves (p < 0.01) and arms and hands (25% vs. 11%) whereas women more often suffered from cramp in feet and toes (53% vs 25%). Wearing high heeled shoes may in part account for this. Pregnancy was the most important risk factor predisposing to muscle cramp (odds ratio 6.3; 95% confidence interval 1.0 to 38.6). Musculoskeletal pain and stiffness also correlated with muscle cramp (2.8; 1 to 7.2). Irritation from diseased, overloaded, or overtrained joints, tendons, or muscles may provoke cramp. Subjects with generalised muscle twitching and fasciculations are prone to developing cramp. In our survey, however, the correlation between fasciculations and muscle cramp was insignificant (1.6; 0.9 to 2.8).

REPORTED INCIDENCE OF AT LEAST ONE MUSCLE CRAMP IN DUTCH ADULTS IN 1988

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<tr>
<th></th>
<th>Men</th>
<th>Women</th>
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<tr>
<td>18–39 yrs</td>
<td>26%</td>
<td>48%</td>
</tr>
<tr>
<td>40–59 yrs</td>
<td>31%</td>
<td>32%</td>
</tr>
<tr>
<td>≥ 60 yrs</td>
<td>52%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28%</td>
<td>44%</td>
</tr>
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</table>

MUSCLE CRAMP

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This well known annual round-up of neuroscience topics has continued since 1902. An invaluable collection of data, it is arranged in date order, but the style of Currier’s comments show more even inferiority than before, containing pertinent remarks and many personal chatty asides which considerably enlivens the text.

Any attempt to capilise the literature in Neurology and Neurosurgery can be seen as testing a neurological Armageddon. There are now available many publications of abstracts, advances and trends; the individual reader’s preference rests with his assessment of the articles selected, the adequacy of the abstract, and the presentation. Once again the Year Book seems to have forgotten nothing of significance. The skill required to produce such intelligible, readable abstracts and commentaries is self-evident.

The preface records the sad passing of Ruskin De Jong on August 23, 1990: “In northern Michigan there was not the usual beautiful shimmering display of northern lights … it was not hard to believe, as probably the Indians did, that there were a message intended, perhaps a signal of some happening, such as the death of a great chief.” With such touches, it is irresistible.

JMS PEARCE

BOOK REVIEWS


As the editors of this multi-author text rightly point out much of the early work on cerebral localisation was based on study of patients with cerebrovascular lesions. The title of this volume might lead one to expect an update on this but, in fact, it covers a much wider field. There is a good section on cerebrovascular pathophysiology, blood flow, metabolic imaging. There follows an overview of the clinical situation including epidemiology, the relationship with cardiac disease and a summary review of current management.

The incidence of muscle cramps was calculated from the telephone interview study. The incidence calculated from telephone interviews and questionnaires was adjusted for age and sex distribution (Iad). Sensitivity and specificity of data collection by telephone interview were 86% and 71% respectively, compared with the data collection from questionnaires. The real incidence of muscle cramp in the general population (Iad) was computed from equations, Iad = Im directly (1 – specificity) Iad = (Im – 0.929)/57.

The table shows the real incidence of muscle cramp calculated from the telephone interview study.
The incidence of muscle cramp.

P H Jansen, E M Joosten, J Van Dijck, A L Verbeek and F W Durian

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