The fibre size and content of the radial and sural nerves

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In a previous study of the human anterior tibial nerve (Swallow, 1966), it was concluded that 'the wide range of variation found in young as well as old subjects would seem to limit the usefulness of anterior tibial nerve biopsy as a diagnostic procedure in patients with generalized neurological disease'.

The present work was undertaken to establish the range of variation in the fibre size and content of the sural and radial nerves, and to assess their suitability for diagnostic biopsy.

MATERIALS AND METHODS

Specimens of radial and sural nerves were taken at necropsy from subjects without evidence of peripheral nerve disease. The age, sex, and cause of death in each case are shown in Table I.

The radial nerve was exposed on the lateral side of the wrist where it overlies the head of the radius. At this level some branching had already occurred, the nerve consisting of one main branch with one or more smaller branches accompanying it. Only the main branch was taken for study. Specimens were obtained from 21 cases, nerves being taken from both wrists in six subjects; in all, 27 radial nerves were examined.

The sural nerve was exposed behind the lateral malleolus. In three cases a single nerve trunk was present at this level, but in the remainder some branching had occurred; the largest branch was then taken for study. Specimens were obtained from 23 cases, nerves being taken from both ankles in four patients; in all, 27 sural nerves were examined.

About 1 cm of each nerve was removed; the specimen was gently stretched over a small piece of card, to which the ends were made to adhere by light pressure. Mounting under slight tension ensured that the nerve remained straight during the subsequent preparation. After mounting, the specimens were placed immediately into Flemming's solution at room temperature for 18 to 24 hr. They were then dehydrated in alcohol and embedded in paraffin. Sections 5 μ thick were cut and stained with Kultschitzky's haematoxylin, as described by Gutmann and Sanders (1943). They were then dehydrated, cleared, and mounted.

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TABLE I

DETAILS OF SUBJECTS STUDIED

Case no.	Age	Sex	Nerve studied	Source	Diagnosis
1 (4)	22	M	R	C	Carbon monoxide poisoning
2 (5)	17	M	R	C	Road traffic accident
3 (6)	46	M	R	C	Coronary thrombosis
4 (7)	65	F	R	C	Road traffic accident
5 (12)	55	M	R : S	C	Coronary thrombosis
6 (11)	34	M	R : S	H	Subacute bacterial endocarditis
7 (13)	68	F	R : S	H	Intracranial tumour (meningioma)
8 (14)	39	F	R : S	H	Intracranial tumour (glioma)
9 (16)	47	M	R : S	H	Intracranial tumour (glioma)
10 (17)	57	M	R : S	H	Intracranial tumour (glioma)
11 (18)	63	M	R	C	Carbon monoxide poisoning
12 (19)	71	M	R	C	Myocardial failure
13 (20)	55	M	R	H	Subarachnoid haemorrhage
14 (21)	28	M	R	H	Road traffic accident
15 (22)	62	F	R	H	Cerebral haemorrhage
16 (23)	63	M	R	H	Cerebral haemorrhage
17	30	F	R : S	H	Colloid cyst of 3rd ventricle
18	26	F	R : S	H	Pituitary tumour
19	26	M	S	H	Intracranial tumour (glioma)
20	45	M	S	H	Cerebral thrombosis
21	50	F	S	H	Subarachnoid haemorrhage
22	48	F	R	H	Pituitary adenoma
23	37	M	R	C	Suspected suicide
24	68	M	R : S	H	Intracranial tumour (glioma)
25	45	F	S	H	Cerebral abscess
26	54	M	S	H	Intracranial tumour (glioma)
27	60	M	S	H	Intracranial tumour (glioma)
28	70	F	S	H	Cerebral infarction
29	37	M	S	H	Intracranial tumour (glioma)
30	48	M	S	H	Pontine haemorrhage
31	31	M	S	H	Pulmonary embolism
32	68	M	S	H	Myocardial infarction
33	68	M	S	H	Myocardial infarction
34	41	M	S	H	Carcinoma of lung with cerebral secondaries
35	62	M	S	H	Cerebral haemorrhage

S = Sural; R = Radial; H = Hospital; C = Coroner's Court.

Numbers in parentheses are case numbers from Swallow (1966) and indicate that the anterior tibial nerves were also studied in these patients.

All sections were photographed at a magnification of × 250 on a Zeiss Ultraphot 11 Camera-microscope using 9 × 12 cm Ilford panchromatic plates. Enlargements were made onto bromide paper and two sets of prints were made.

(a) All sections were printed at a magnification of × 500 for the estimation of fibre density.

(b) Selected nerves were enlarged to × 1,000 for the measurement of fibre diameter. During the process of enlarging, magnification was checked regularly using a plate on which the micrometer scale had been photographed.

Details of the method of fibre counting, of the measurement of fascicular area, and of the construction of histograms are given by Swallow (1966). In the prepara-

tion of histograms all fibres with a diameter of 2 μ or less were grouped together; larger fibres were subdivided into 1 μ groups.

RESULTS

VARIATION OF FASCICULAR SIZE   The diameter of individual fascicles varied from 0·075 mm to 0·69 mm for the radial nerve, and from 0·056 mm to 0·742 mm for the sural nerve. As in the previous study, fascicles with a diameter of less than 100 μ were considered to be unsuitable for the estimation of fibre density. There were five such fascicles in the 27 radial nerves and 13 in the 27 sural nerves.

For the remaining 182 radial nerve fascicles the mean diameter was 0·373 mm (S.D. 0·13). In 217 sural nerve fascicles with a diameter greater than 100 μ, the mean diameter was 0·338 mm (S.D. 0·11). There was no correlation between fascicular diameter and the age of the subject.

VARIATION IN FIBRE DENSITY   Fibre density may be expressed as the number of fibres per sq. mm of intra-perineural area. This was calculated for each fascicle and results are shown graphically in Figure 1.

In the 182 radial nerve fascicles the highest fibre density was 11·04 thousand fibres/sq. mm in a 17-year-old male, and the lowest was 3·48 thousand fibres/sq. mm in a 65-year-old subject.

In the 217 sural nerve fascicles the highest fibre density was 8·99 thousand fibres/sq. mm in a subject aged 39, and the lowest was 2·04 thousand fibres/sq. mm in a 62-year-old subject.

Mean fibre density for each of the 54 nerves has been calculated by adding together the numbers of myelinated fibres in each fascicle (fascicles with a diameter of less than 100μ being ignored), and dividing the total number of fibres in each nerve by the sum of the intra-perineural areas of individual fascicles. In Fig. 2, the mean fibre density is plotted against age, results for the radial nerve being shown above and those for the sural nerve below.

In both nerves there is a tendency for mean fibre density to decrease with age. Using Spearman's Ranking test, the inverse relationship between fibre density and age was significant at the 0·01 probability level for the radial nerve, and the 0·05 probability level for the sural nerve (for the radial nerves R = 0·56; for the sural nerves R = 0·43).

Figure 2 does not suggest an obvious difference between the sexes, and when the mean values for males and females were calculated, there was no significant difference between them in either the radial or the sural nerve (Table II).

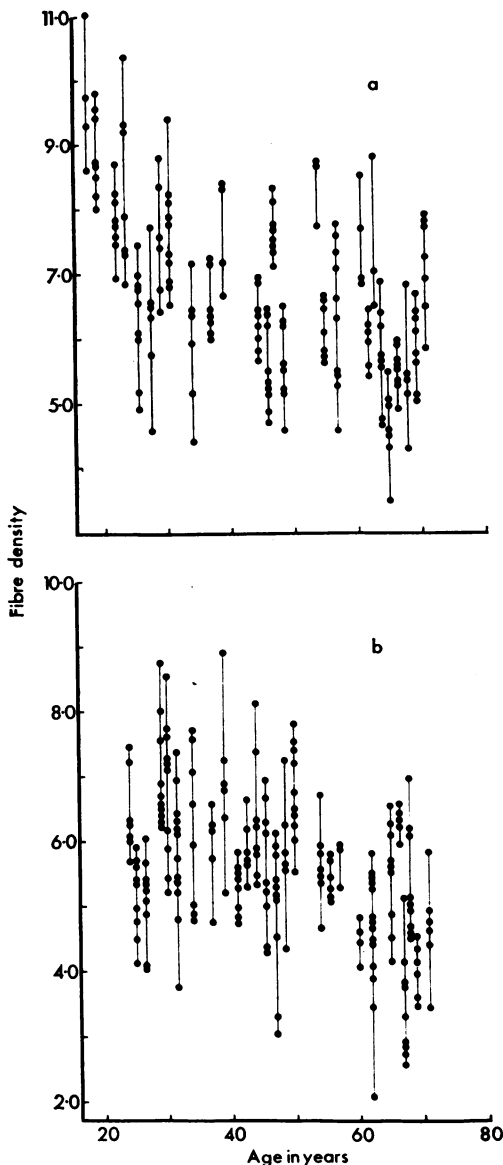The mean figure for fibre density for various age

FIG. 1.   *Fibre density (thousand fibres/sq. mm) of individual fascicles of the radial nerve (a) and the sural nerve (b) plotted against the subject's age. Values for different fascicles of the same nerve are joined by a line.*

TABLE II

MEAN AND S.D. FOR FIBRE DENSITY OF NERVES FROM MALE
AND FEMALE SUBJECTS (THOUSAND FIBRES/SQ. MM)

Radial		Sural	
Males	*Females*	*Males*	*Females*
(17 nerves)	(10 nerves)	19 nerves	(8 nerves)
7·16 ± 1·28	6·29 ± 1·08	5·56 ± 0·6	5·82 ± 1·2

TABLE III

FIBRE DENSITY IN DIFFERENT AGE GROUPS

	Radial		Sural	
Age	*Nerves (no.)*	*Mean fibre density and S.D.*	*Nerves (no.)*	*Mean fibre density and S.D.*
17-39	11	7·44 ± 1·34	9	6·13 ± 1·11
40-59	7	6·37 ± 1·05	10	5·78 ± 0·90
60-80	9	5·98 ± 1·07	8	4·78 ± 1·08

TABLE IV

FIBRE DENSITY IN TWO LIMBS (THOUSAND FIBRES/SQ. MM)

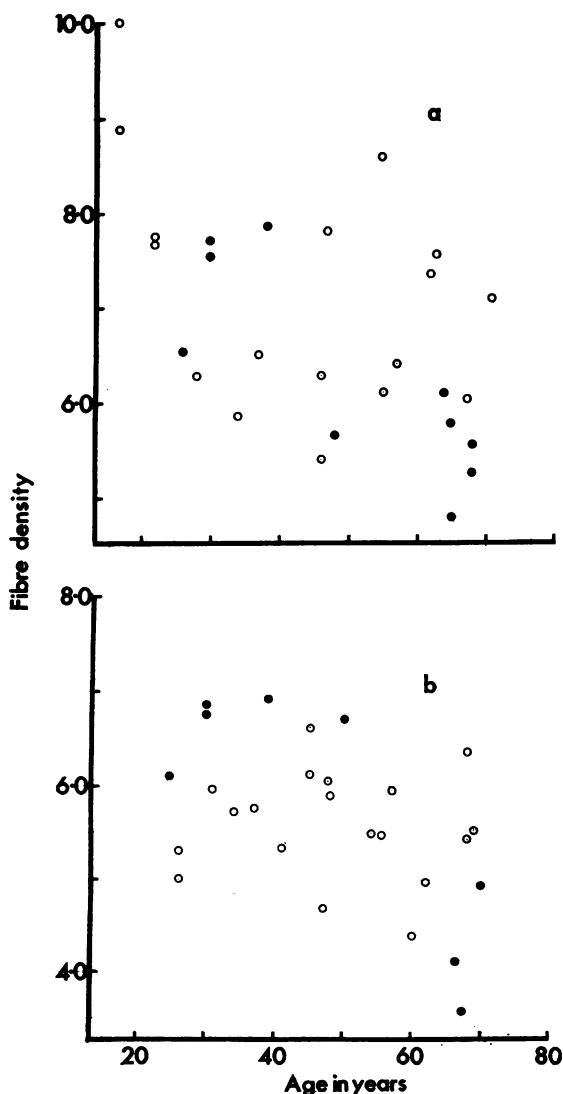| Case no.	Right	Left
	Radial nerve	
1	7·81	7·86
2	8·89	10·02
3	5·41	6·29
4	4·78	5·80
7	5·29	5·57
17	7·72	7·55
	Sural nerve	
24	6·37	5·44
20	6·13	6·62
19	5·30	5·02
17	6·87	6·76

FIG. 2.   *Mean fibre density (thousand fibres/sq. mm) of the radial nerve (a) and the sural nerve (b) plotted against the subject's age. (Open circles for male and filled circles for female subjects).*

groups is shown in Table III. Because the number of nerves in each group was small, the differences between the mean figures for consecutive age groups failed to reach statistical significance.

There were six cases in which the radial nerves were taken from both arms, and four cases in which the sural nerves were taken from both legs. Figures for fibre density are given in Table IV, from which it can be seen that in any one subject there was little difference between the nerves on the two sides.

COMPARISON BETWEEN ANTERIOR TIBIAL, RADIAL, AND SURAL NERVES   When the previous results of Swallow (1966) are added to those of the present study, there were six subjects from whom both the anterior tibial and the sural nerve were taken (see Table I). Mean figures for fibre density in the two sets of nerves were 4·73 thousand fibres/sq. mm (S.D. 1·03) for the six anterior tibial nerves and 5·62 thousand fibres/ sq. mm (S.D. 1·11) for the six sural nerves; this difference is not statistically significant.

In 16 subjects, specimens of both the anterior tibial nerve and the radial nerve were taken. The mean figure for fibre density in the 16 anterior tibial nerves—expressed as thousand fibres/sq. mm— was 4·75 ± 1·31, whereas the mean figure for the 16 radial nerves was 6·94 ± 1·18, the difference being statistically significant ($P < 0.05$).

Sural and radial nerves from the same subjects were available in nine cases. The mean figure for fibre density for the nine sural nerves (5·84 ± 0·95)

was again less than that for the nine radial nerves
(6·61 ± 0·95), the difference being statistically
significant ($P < 0·05$).

VARIATION IN FIBRE SIZE AND DISTRIBUTION Seven-
teen radial nerves and 16 sural nerves were used for
the study of fibre diameter. Care was taken to
include nerves from all age groups.

Fibre diameter measurements were made on one
or more large fascicles, measuring between 600 and
1,000 fibres in each case.

In both the radial and the sural nerve there was a
bimodal distribution of fibre diameter with peaks at
3-6 μ and 9-13 μ. An example is shown in Figure 4c.
In a previous study on the anterior tibial nerve, it
was found that the proportion of large myelinated
fibres tended to decrease with increasing age, the
inverse relationship between the proportion of large
fibres and the subject's age being significant at the
5% level by Spearman's Ranking test (Swallow,
1966). In the present material the proportion of
large fibres (9-13 μ inclusive) for the radial nerve
showed no significant decrease with increasing age,
whereas for the sural nerve, the inverse relationship
between the proportion of large fibres and the sub-
ject's age was significant at the 0·05 probability
($R = 0·49$). Results for individual nerves are given
in the appendices.

FIBRE DENSITY AND FIBRE DIAMETER IN PATHOLOGICAL
NERVES The effects of subacute combined degenera-
tion and alcoholic neuropathy on fibre density and
fibre diameter in the anterior tibial nerve were
originally described by Greenfield and Carmichael
(1935). Subsequently Garven, Gairns, and Smith
(1962) described changes in the anterior tibial nerve
due to obliterative vascular disease.

The two examples given below are intended to
illustrate the value of fibre density and fibre diameter
measurement in patients with pathological changes
affecting the sural nerve.

Case 1: Alcoholic Neuropathy Mr. A. F. (N.H. A16801),
aged 47, had been a heavy drinker (at least one bottle of
gin per day) for seven to eight years before his admission
to the National Hospital, Queen Square, under the care
of Professor R. W. Gilliatt in March 1964. For two
years his appetite had been poor and for one year there
had been deterioration of vision. In the year before
attending hospital, he noticed numbness and pins and
needles in the feet and in the lower part of his legs; this
was associated with ataxia, particularly when walking
in the dark.
On examination, there was evidence of intellectual
impairment. Both optic discs were pale with bilateral
paracentral scotomata. There was nystagmus on lateral
gaze. In the motor system, he showed tremor of out-

stretched hands, but no wasting or weakness of the
limbs. The deep tendon reflexes were sluggish but present
except for the ankle jerks which were absent. There was a
glove-and-stocking pattern of superficial sensory loss
to pin-prick and cotton wool which was more marked in
the legs than the arms; in the former it extended to just
below the knees. Position sense was impaired in the
toes and vibration sense lost below the knees. The liver
was easily palpable below the costal margin. A grossly
abnormal pyruvate tolerance test was considered to be
compatible with alcoholic polyneuropathy. Considerable
improvement of his clinical condition followed the
complete withdrawal of alcohol and parenteral vitamin
supplements.

Case 2: Thalidomide Neuropathy Mrs. C. F. (M.H.
G.22497), aged 55, began taking thalidomide (Distival)
as a regular nocturnal sedative in 1959. Within a few
months she noticed paraesthesiae in the right foot,
later spreading to involve the left foot. She continued to
take the drug regularly for two years, during which
time her symptoms slowly progressed.
She was admitted to the Middlesex Hospital under the
care of Dr. Michael Kremer in November 1963. Although
she had received no thalidomide for nearly two years,
she still complained of paraesthesiae, which she thought
had become more intense since stopping the drug. She
described her symptoms in the legs as a tight feeling
round the base of the toes and a drawing feeling over her
ankles. These paraesthesiae were exacerbated by walking.
On examination, there was no abnormality in the
cranial nerves or in the motor system. The tendon
reflexes were normal except for the ankle jerks which
were depressed; the plantar responses were flexor.
Distal impairment of superficial sensation extended to
the wrist in both upper limbs and to the mid-calf in
both lower limbs. Marked hypersensitivity to pin-prick
and light touch was present over the soles of the feet
and palms of the hands. Appreciation of vibration and
joint movement was preserved.

Sural nerve biopsies were carried out in both
patients. No significant changes in connective tissue
or in the intra-perineural blood vessels were present
in either nerve, and no segmental demyelination was
found in teased preparations of single fibres
(Dr. R. G. Lascelles).

Portions of the transverse sections of the two
pathological sural nerves and of the sural nerve
from a control subject of similar age are shown at
the same magnification in Figure 3. There appears on
first inspection to be a reduction in fibre density in
both pathological nerves compared with the control.
On quantitative study, the apparent reduction in
density was confirmed for the nerve from the
alcoholic subject, the mean fibre density being
1·86 (thousand fibres/sq. mm) compared with 5·50 for
the control nerve. However, in the nerve from the
patient intoxicated by thalidomide, the mean fibre
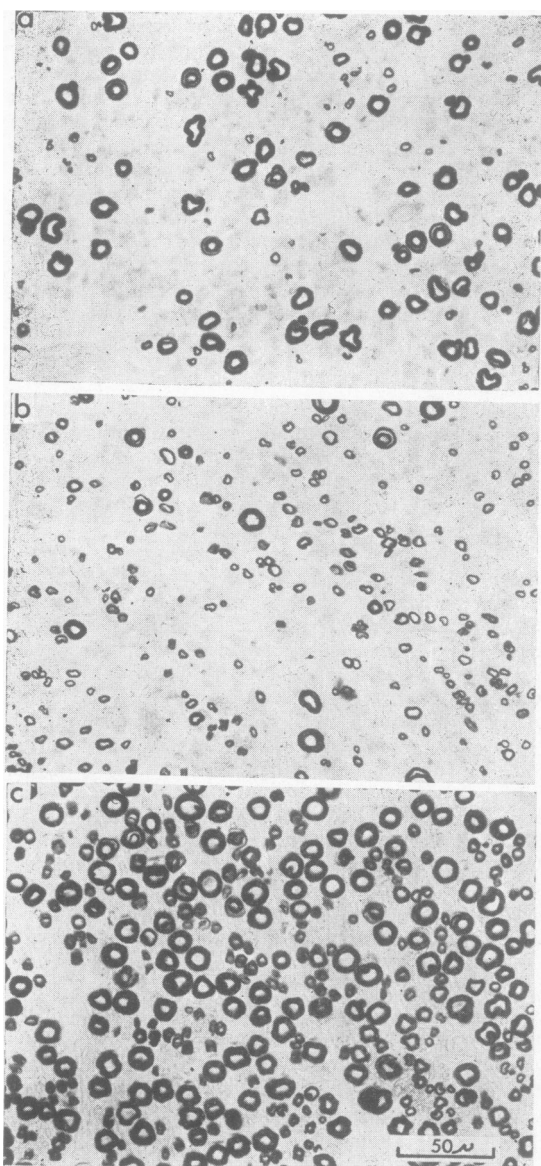density was 5·02, which is within the normal range.

FIG. 3. (a) Portion of transverse section of the sural nerve from Case 1.
(b) Portion of transverse section of the sural nerve from Case 2.
(c) Portion of transverse section of the sural nerve from control subject (No. 26). Scale 50 μ.

Histograms of fibre diameter of the three nerves are shown in Figure 4. In the nerve from the alcoholic patient (Fig. 4a) the distribution of fibre diameters was similar to that of the control, suggesting that both large and small fibres were similarly affected by the disease process. However, in the nerve

from the patient who had taken thalidomide (Fig. 4b) the large fibre peak has disappeared, the nerve consisting mainly of fibres less than 8 μ in diameter. It might be thought that this indicates selective loss of large fibres, but further study showed an absolute increase in the number of small fibres compared with the control nerve, presumably due
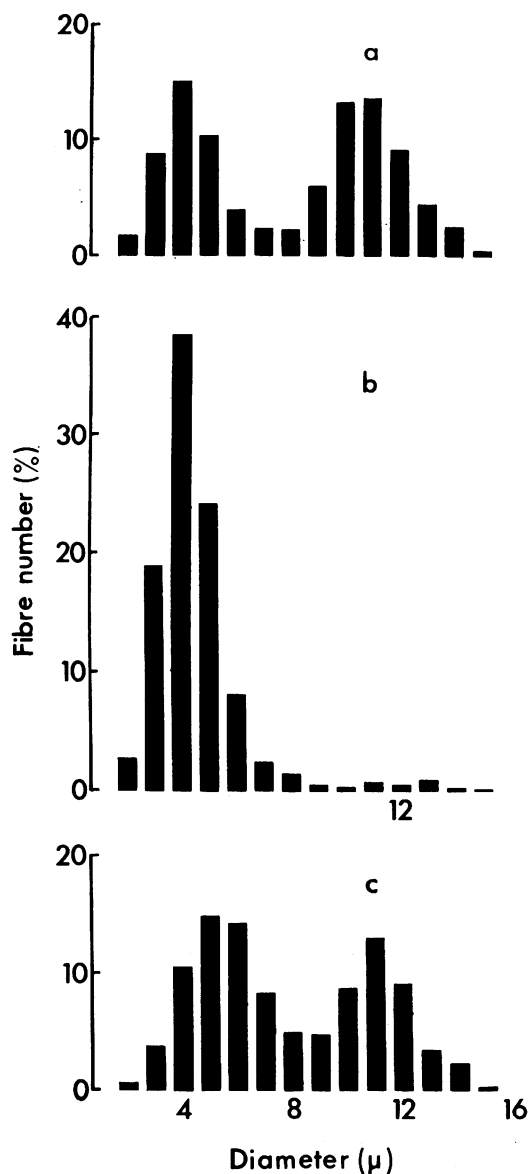

FIG. 4. Percentage histograms of fibre diameter of the sural nerves from: (a) Case 1. (b) Case 2. (c) Control subject (No. 26).

to regeneration. This phenomenon, which has been found on more than one occasion in patients with thalidomide neuropathy, is discussed elsewhere (Fullerton and O'Sullivan, 1968).

For the present purpose, it is sufficient to conclude that the quantitative studies revealed significant differences between two nerves which might have been expected to show similar pathological changes.

DISCUSSION

In the previous study by Swallow (1966), the anterior tibial nerve at the site of biopsy was either a single nerve trunk or split into two easily recognizable branches. It was therefore possible to take either the whole nerve trunk or both its branches and to count all the myelinated fibres present. In the present study the radial nerve and the sural nerve were often found to consist of several branches at the level of the biopsy. As only the main branch was taken, figures for the total number of myelinated fibres would have little meaning and have not been given in the present paper.

The presentation of results in the form of fibre density is open to the objection that the results are affected by changes in fascicular area as well as by changes in fibre population. However, there is no reason to believe that the decreasing fibre density, which we have shown to occur with increasing age in the present material, was due to fascicular swelling. In fact, fascicular area showed no significant trend with age. The present results, therefore, suggest that some diminution in fibre numbers occurs with increasing age; a similar trend was demonstrated by Swallow in the case of the anterior tibial nerve on the basis of total fibre counts.

A difference between the arm and the leg has been shown in relation to the proportion of large myelinated fibres. In the anterior tibial nerve there was a significant fall in the proportion of large myelinated fibres with increasing age; in the present study a similar trend has been demonstrated for the sural nerve but not for the radial nerve. It might be suggested that this difference between nerves of the upper and lower limbs is related to the greater susceptibility of the latter to trauma and vascular disease.

There are few figures for fibre density in the radial nerve or the sural nerve available in the literature, and we are not aware of any previous study of the effects of age on fibre diameter and density in these nerves. Dyck, Beahrs, and Miller (1965) and Dyck and Lambert (1966) have published figures for human sural nerves taken from subjects with no evidence of peripheral nerve disease. Their figures

were higher than those of the present study, probably due to differences of technique in fixation, staining, and the measurement of fascicular area. Ranson, Droegemueller, Davenport, and Fisher (1935) in a study of human cutaneous nerves showed that in the superficial radial nerve the small diameter peak was at 2-4 μ, and the large diameter peak was at 8-12 μ. Only one nerve was examined and fibre density was not calculated. Sunderland, Lavarack, and Ray (1949) and Lavarack, Sunderland, and Ray (1951) studied fibre size in normal human radial and sural nerves and described fibres of slightly larger diameter than any seen in the present work; this difference may be related to the site of nerve section which was proximal in their study. Lavarack *et al.* (1951) made the specific comment that fibre branching tended to reduce maximal diameter when distal sections of the same nerves were studied.

It may therefore be concluded from our data and from previous studies that comparisons between one set of data and another can only be made when sections have been taken at the same level and processed by the same technique. When a standardized procedure is used, the quantitative study of pathological radial and sural nerve biopsies may be expected to provide clinically useful information of the kind illustrated by the two patients described in the present paper.

SUMMARY AND CONCLUSIONS

The myelinated fibre content of the radial nerve and the sural nerve has been studied in necropsy specimens from subjects between the ages of 17 and 71 years with no history of peripheral nerve disease. Twenty-seven nerves were obtained from 21 subjects for the radial nerve, and 27 nerves were obtained from 23 subjects for the sural nerve. There was a significant fall in fibre density with increasing age in both the radial nerve and the sural nerve.

The fibre diameter spectrum was studied in 17 radial nerves and 16 sural nerves. There was a decrease in the proportion of large diameter fibres with increasing age in the sural nerve, but not in the radial nerve.

Two case histories have been described which illustrate the value of estimating fibre density and fibre diameter in pathological sural nerves.

The importance of a standardized technique has been emphasized.

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APPENDIX I

RADIAL NERVES

NUMBERS OF FIBRES IN EACH DIAMETER CATEGORY EXPRESSED AS PERCENTAGE OF THE SAMPLE MEASURED[1]

Case no.	Nerve	Age	Mean fibre density	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16μ
2	Radial	17	10·02	2·1	7·7	14·5	12·0	11·3	8·2	8·0	9·7	12·2	10·1	3·4	0·6			
1	,,	22	7·86	4·0	12·1	18·8	16·2	11·4	6·7	7·4	9·7	7·6	3·9	1·9				
14	,,	28	6·28	1·9	11·2	17·3	12·1	8·6	5·6	5·7	9·5	12·4	9·2	4·6	1·3	0·3	0·2	
6	,,	34	5·87	1·1	4·0	9·8	13·3	14·8	13·0	8·1	5·8	7·4	9·4	7·1	4·0	1·8	0·5	
3	,,	46	5·41	1·3	3·7	11·3	9·4	6·7	7·1	7·3	6·0	6·5	11·7	11·7	9·6	5·7	1·3	0·6
9	,,	47	7·83	4·6	10·6	12·5	7·6	6·3	4·9	4·4	6·0	7·9	9·8	11·9	6·8	4·3	2·0	
13	,,	55	8·63	1·2	7·7	17·0	15·1	10·5	7·1	6·4	5·9	8·2	9·3	8·1	2·5	0·8	0·2	
10	,,	57	6·41	2·2	7·7	15·3	14·0	8·6	4·9	4·8	5·7	3·7	8·3	11·0	9·7	2·6	0·4	0·3
15	,,	62	6·11	4·3	6·9	8·6	6·7	6·2	6·4	4·4	7·3	9·3	9·9	8·1	10·6	5·9	3·6	1·4
16	,,	63	7·38	1·8	7·9	11·2	10·0	8·6	7·7	6·0	7·7	10·4	13·0	10·6	3·7	1·4	0·1	
11	,,	63	7·57	2·0	10·5	15·3	11·4	6·1	4·8	6·5	7·7	15·2	13·3	5·2	1·2	0·6	0·2	0·1
4	,,	65	4·78	0·9	5·5	10·6	11·8	9·6	6·1	5·2	3·9	5·7	8·9	9·3	9·2	9·3	2·8	1·2
4	,,	65	5·80	1·1	4·0	8·7	9·9	9·4	6·5	7·0	5·7	7·3	10·9	13·3	10·1	3·8	1·9	0·4
7	,,	68	5·27	4·3	7·5	10·7	9·9	8·5	6·5	5·3	4·7	5·9	6·8	7·7	8·9	8·1	3·4	1·7
7	,,	68	5·57	7·2	13·2	16·0	9·4	6·0	4·6	6·2	6·2	9·5	9·1	6·4	4·1	1·6	0·5	
24	,,	68	6·06	0·8	10·0	13·6	9·8	9·0	9·5	7·0	5·6	5·7	8·9	9·5	5·8	3·4	1·3	0·2
12	,,	71	7·14	3·7	11·7	16·3	11·5	8·2	8·2	8·2	6·3	6·8	6·1	6·1	3·7	2·0	0·8	0·3

[1] Diameter measurements made on 600-1,000 fibres in each nerve.

APPENDIX II

SURAL NERVES

NUMBERS OF FIBRES IN EACH DIAMETER CATEGORY EXPRESSED AS PERCENTAGE OF THE SAMPLE MEASURED[1]

Case no.	Nerve	Age	Mean fibre density	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16μ
18	Sural	26	6·10	0·9	5·2	13·1	16·7	14·5	8·6	5·7	4·3	6·6	11·4	9·0	3·6	0·5	0·5	
17	,,	30	6·76	1·1	10·0	18·6	14·6	6·1	3·1	3·7	3·7	11·0	15·7	8·9	2·4	1·0	0·2	
31	,,	31	5·98	1·4	5·9	14·2	15·8	11·4	5·6	4·4	6·3	10·2	11·0	7·8	3·9	1·5	0·5	
34	,,	41	5·34	4·5	8·2	14·4	14·1	10·5	6·1	4·2	4·3	7·1	8·7	7·2	6·0	3·0	0·8	0·5
20	,,	45	6·62	1·4	5·8	12·5	15·5	16·4	10·7	7·4	4·2	8·1	8·3	5·3	3·6	0·8		
9	,,	47	6·05	1·7	7·9	15·4	14·0	9·8	5·8	6·7	8·1	15·3	9·0	4·2	1·5	0·5		
26	,,	54	5·50	0·4	4·0	10·6	15·0	14·5	8·1	5·1	4·9	8·8	13·0	9·4	3·6	2·3	0·2	0·1
10	,,	57	5·95	2·3	6·0	10·3	9·7	9·0	7·2	6·5	7·2	9·1	11·2	9·8	6·8	3·3	1·2	0·4
27	,,	60	4·39	3·1	11·2	21·0	17·3	11·9	6·8	6·9	6·7	6·1	3·6	3·6	1·8			
35	,,	62	4·99	1·0	3·3	9·6	14·5	13·2	10·5	6·1	7·4	6·9	10·5	7·4	4·9	2·6	1·3	0·5
33	,,	68	5·52	2·0	3·6	9·8	14·5	13·9	8·9	6·3	6·3	5·8	5·4	6·7	7·4	5·6	2·7	1·4
32	,,	68	4·12	1·5	7·6	8·6	8·3	11·1	10·2	8·5	4·5	3·6	7·3	6·6	7·7	5·8	5·4	3·5
24	,,	68	5·44	1·0	6·2	13·8	13·9	10·3	6·1	4·6	5·0	7·5	9·4	10·0	6·9	3·9	1·1	
24	,,	68	6·37	2·4	10·0	12·3	16·0	10·0	7·4	4·1	3·1	4·6	7·3	9·1	8·1	4·3	0·6	0·4
7	,,	68	3·56	3·6	12·1	17·7	13·6	9·4	6·8	4·6	4·2	7·2	8·8	8·0	2·9	1·3	0·2	
28	,,	70	4·95	1·6	4·6	8·6	14·2	16·1	16·1	10·9	5·0	2·6	5·2	4·3	3·6	3·4	2·6	1·4

[1] Diameter measurements made on 600-1,000 fibres in each nerve.