INFLUENCE OF AGE ON RESIDUAL LATENCY

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Summary: From the conduction studies of ulnar nerve on normal individuals of different age groups and sexes the residual latencies were determined. The age has no influence on the residual latency. But the values of residual latency decreased significantly in the case of females as compared with males.

Key words: residual latencies age groups ulnar nerve

INTRODUCTION

The study of residual latency offers a new tool in the assessment of neuromuscular function (1). Only a few workers have determined the residual latency in the nerve conduction studies. Estimates on healthy Indian subjects became necessary to serve as age matched controls for assessing abnormalities in the conduction studies of peripheral nerves in diabetic neuropathy, leprosy and other metabolic disorders. We have reported earlier about the effect of age on the conduction velocity of the fastest motor fibres (7). In the present work an attempt has been made to calculate the residual latencies and to study the effect of age on residual latency.

MATERIALS AND METHODS

Apparently healthy subjects attending the out-patient department of JIPMER Hospital for minor surgical ailments having no metabolic disorders and medical students constituted the sample which included 105 males and 73 females. They were grouped into age groups 15,20, 21-30, 31-40, 41-50 and 51-60 years.

Latencies were measured by the usual method of stimulating the ulnar nerve at two distances from the hypothenar muscle and recording their evoked potentials on the cathode ray oscilloscope with suitable amplification. Time marks, delivered by Time Mark generator, Tektronix 184, were displayed on the other beam of the dual beam Tektronix oscilloscope. Latencies were measured from the stimulus artifact to the first inflexion, which is due to the fastest conducting fibres. The conduction velocities were determined and then the residual latencies were calculated.

The measurements were performed in a quiet air conditioned room with ambient temperature $27° \pm 0.5°$ and the subject relaxed.

RESULTS AND DISCUSSION

The results are summarized in Table I for males and females. The statistical analysis for males and females of different age groups is given in Tables II and III.

TABLE I: Residual latencies in males and females of different age groups.

S. No.	Age (yrs)	Males		Females		t value
		Number	Residual latency ±S.E. (msec)	Number	Residual latency ±S.E. (msec)	
1	15-20	19	2.53±0.17	18	1.75±0.07	4.05
2	21-30	29	2.61±0.13	16	1.78±0.93	2.78
3	31-40	23	2.54±0.09	14	1.85±0.03	5.10
4	41-50	14	2.47±0.11	15	1.72±0.11	4.75
5	51-60	20	2.18±0.18	10	1.90±0.03	1.42

TABLE II: Statistical analysis of residual latencies of males in different age groups.

S. No.	Age group (yrs.)	Residual latency (msec.)	Age group (yrs.)	Residual latency (msec.)	t value
1	15-20	2.53	21-30	2.61	0.91
2	15-20	2.53	31-40	2.54	0.11
3	15-20	2.53	41-50	2.47	0.02
4	15-20	2.53	51-60	2.18	1.65
5	21-30	2.61	31-40	2.54	0.40
6	21-30	2.61	41.50	2.47	0.67
7	21-30	2.61	51-60	2.18	1.74
8	31-40	2.54	41-50	2.47	0.48
9	31-40	2.54	51-60	2.18	1.80
10	41-50	2.47	51-60	2.18	1.19

TABLE III: Statistical analysis of residual latencies of females in different age groups.

S. No.	Age group (yrs.)	Residual latency (msec.)	Age group (yrs.)	Residual latency (msec.)	t value
1	15-20	1.75	21-30	1.78	0.35
2	15-20	1.75	31-40	1.85	0.37
3	15-20	1.75	41-50	1.72	0.24
4	15-20	1.75	51-60	1.90	1.59
5	21-30	1.78	31-40	1.85	0.54
6	21-30	1.78	41-50	1.72	0.58
7	21-30	1.78	51-60	1.90	0.86
8	31-40	1.85	41-50	1.72	0.92
9	31-40	1.85	51-60	1.90	0.38
10	41-50	1.72	51-60	1.90	1.18

Different values for the residual latencies have been reported by various workers in the field: Hodes *et al.* (4), 2.2 msec.; Norris *et al.* (10), 1.7 msec.; and Balyani (2), 2.68 msec. An interesting point was put forth by workers like Trojaborg (11) who working on ulnar and median nerves stated that conduction in the distal portion of the nerve was slower than in the proximal portion. This was also reported by earlier workers like Gilliat and Thomas (3) and Magladery (9). An important component of residual latency was reported to be the time taken for the muscle to respond to depolarisation of the end plate. We should also take into account the slow conduction in muscle fibres and the delay due to transmission across the neuromuscular junction.

Our present results indicate that age has no effect on residual latency. Norris *et al.* (10) also observed that there was no change in the residual latency due to age. Earlier this laboratory has reported that age influences the conduction velocity of fastest nerve fibres of ulnar nerve (7), the conduction rate significantly decreasing after the age of 40 in the case of males and after the age of 50 in the case of females. A similar effect was also reported by Norris *et al.* (10). As against the conduction velocity in which no sex difference was found, our present study showed a significant decrease in the residual latency in females as compared to that in males.

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