Research Journal of Pharmaceutical, Biological and Chemical Sciences

Effect of Excessive Mobile Phone Text Messaging on Thumb Muscle.

Renuka Devi MR[1]*, P Saikumar[1], and Pradhosh[2].

[1]Department of Physiology, Sree Balaji Medical College and Hospital, Bharath University, Tamil Nadu, India.
[2]Sree Balaji Medical College and Hospital, Bharath University, Tamil Nadu, India.

ABSTRACT

Text messaging has become a part and parcel of everyone's life including adults and teen age. , We do not know how much we strain our muscle during messaging eg. , Over strain to thumb. This causes repetitive stress injury (RSI) to the muscles. The outcome of this extended intensive use of mobile phones and other devices may generate pain and musculoskeletal disorders in the thumbs and the associated joints. To record and compare electromyogram of thumb muscle for those messaging(SMS) using mobile phone after classifying them as users and non users (Usage less than 25 messages per day as non-users). Around 50 right handed healthy students of Sree Balaji Medical college were recruited for this study. They were classified as users and non users depending on the usage details from the questionnaire collected from them. EMG(electromyogram of the thumb muscle of both the hands were recorded using RMS Polyrite. Peak to Peak values and Amplitude from the Graph of EMG recorded from thumb muscles of both the hands showed that the values did not show significant changes in the right hand between users and non users, whereas it was significant in the left hand between users and non users. This result explains us that since the right hand is used in so many types of work like writing and typing , the excessive usage while text messaging use did not affect the EMG of the thumb muscles of the right hand, whereas the left hand which is not used to work is put to unnecessary strain and shows significant changes in EMG between users and non users.
Keywords: Electromyogram, Text messaging, Thumb muscles

*Corresponding author

INTRODUCTION

The world after 20th century is one, which many people today would be completely lost without their mobile phone [1] .Text messaging has become a part and parcel of everyone's life including adults and teen age. There are evidences that people do around 1000 messaging per day.Not only that we message and strain our muscles, we also Surf the web and spend time with video games etc., We do not know how much we strain our muscle during this process eg. , Over strain to thumb. This causes repetitive stress injury (RSI) to the muscle which we use the most [2, 3]. The outcome of this extended intensive use of mobile phones and other devices may generate pain and musculoskeletal disorders in the thumbs and the associated joints [4]. This study aims at finding the stress given to the thumb muscles during text messaging.

Objectives

To record and compare electromyogram of thumb muscle for those messaging(SMS) using mobile phone after classifying them as users and non users (Usage less than 25 message per day as non-users)**.**

MATERIALS AND METHODS

Around 50 right handed healthy students of Sree Balaji Medical college were recruited for this study. EMG (electromyogram) of the thumb muscle of both the hands was recorded using RMS Polyrite.

Institutional ethical clearance was obtained for the study. Subjects with any history of drug intake, any chronic illnesss were excluded. Those having the habit of messaging (SMS) using mobile phones for the past 3 years or more were included. After obtaining written informed consent, structured questionnaire containing questions related to the inclusion, exclusion criteria and usage of text messaging were obtained. 50 students were categorized as those using average of 1) 25 SMS and less per day as group I. 2) Between 26 to 1000 SMS per day as group II. 3) Above 1000 SMS per day as group III. Then EMG of thumb muscles of both the hands was recorded using RMS polyrite by surface electrode, between 10 am and 12 Noon in the research lab of Physiology Dept.of SBMCH. The EMG patterns were compared between group I,II,III and then compared between left and right hand They are analyzed statistically by ANOVA .

DISCUSSION

Table 1 shows that the peak to peak values keeps on increasing as the number of messaging per day increases both in the right as well as in the left hand . But the changes in the right hand between the groups is not significant (p value = 0.327) as compared to the left hand . Whereas the the changes in the left hand is very close to significant (p value =0.071) .When we analyse table 2. The significance in peak to peak value of left hand between group I and Group III (0.077)is appreciable than those between group I and group II (0.916) and Between II and III(0.087). But peak to peak values in the right hand does not show much significance in any of the groups.

RESULTS

Table 1 : showing comparison of peak to peak values of EMG between groups and handedness

PEAK TO PEAK-EMG GRAPH	No of students	LEFT HAND MEAN ±SD	RIGHT HAND MEAN±SD
1-25(GROUP I)	13	823.23 ±613.852	853.54± 279.781
26-1000(GROUP II)	30	907.30± 546.067	1132.6±587.980
>1000(GROUP III)	7	1483.43±967.955	1170.29± 945.665
TOTAL	50	966.10± 655.173	1065.32± 591.209

SIGNIFICANCE

PEAK TO PEAK LEFT	BETWEEN GROUP WITHIN GROUP	P=.071
PEAK TO PEAK RIGHT	BETWEEN GROUP WITHIN GROUP	P=.327

Table 2: showing comparison of peak to peak values within groups I,II,III

Dependent variable	No of messaging /day	No of messaging / day	significance
Peak to peak-left hand	1-25(I)	26-1000	0.916
		>1000	0.077
	26-1000(II)	1-25	0.916
		>1000	0.087
	>1000(III)	1-25	0.077
		26-1000	0.087
Peak to peak- right hand	1-25(I)	26-1000	0.336
		>1000	0.491
	26-1000(II)	1-25	0.336
		>1000	0.987
	>1000(III)	1-25	0.491
		26-1000	0.987

Table3: showing comparison of Amplitude between groups and handedness

AMPLITUDE	NUMBER	LEFT	RIGHT
1-25	13	326.23±191.303	413.92±226.497
26-1000	30	429.75±248.88	604.03±354.677
>1000	7	707.14 ± 623.719	464.86 ±211.659

SIGNIFICANCE

AMPLITUDE LEFT	BETWEEN GROUP WITHIN GROUP	.040
AMPLITUDE RIGHT	BETWEEN GROUP WITHIN GROUP	.160

Table 4: showing comparison of Amplitude of the graph within groups I,II,III

Dependent variable	No of messaging /day	No of messaging / day	Significance
Amplitude-left hand	1-25(groupI)	26-1000	0.580
		>1000	0.032
	26-1000(II)	1-25	0.580
		>1000	0.097
	>1000(III)	1-25	0.032
		26-1000	0.097
Amplitude-right hand	1-25(I)	26-1000	0.167
		>1000	0.935
	26-1000(II)	1-25	0.167
		>1000	0.539
	>1000(III)	1-25	0.935
		26-1000	0.539

Similarly when we analyse Table 3, it shows that the Amplitude of the graph in the left hand is increasing in the groups and it is significant (0.040) whereas in the right hand it is not increasing. Table 4 shows that the amplitude between group I and III in the left hand is significant (0.032) but not so between group I and III and between group II and III , In the same way the amplitude in the right hand between none of the groups is found to be significant.

CONCLUSION

As we have discussed already, the EMG in terms of peak to peak value and Amplitude in the right hand between users and non users after text messaging is not affected much. Whereas it is affected in the left hand. This result explains us that since the right hand is used in so many types of work like writing and typing, the excessive usage while text messaging did not affect the EMG of the thumb muscles of the right hand, whereas the left hand which is not used to work as a routine is put to unnecessary strain and shows significant changes in EMG between users and non-users.

ACKNOWLEDGEMENT

REFERENCES

[1]   Science Daily- June 24,2009.
[2]   Koh TH. Med J Aust 2000;173:671.
[3]   Deepak Sharan and Ajesh PS. Work 2012:1145-1148
[4]   Per Jonsson et al. J Eelectromyogr Kinesiol 2011;21:363-370.