

Assessment of Task Specific Kinetic Finger Tremor while Playing Carrom Using Surface Electromyography

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A tremor has been observed in the middle finger in one fourth of carrom players just before striking. The aim of this study is to describe the characteristics of the above tremor and to determine its effect on the performance of the carrom players using surface electromyography and spectral analysis.

The details regarding carrom play, tremor and any conditions that could precipitate tremor in 150 otherwise normal young adults, who are carrom players, were obtained using a questionnaire. The real time recording of surface Electromyography (EMG) activity of the Extensor Digitorum Cominis (EDC) muscle of the dominant hand was obtained in a study group of 20 subjects who developed tremor and in a non-tremor control group of 20 subjects. The tremor group and the non-tremor controls were compared at 95% confidence on the frequency, power and performance.

Out of the 150 subjects, 23.3% believed to have a tremor, of whom, 60% believed that the tremor was adversely affecting their performance. The mean frequency of the EMG activity of EDC while playing carrom were 8.310Hz and 8.605Hz for the tremor and non-tremor control groups respectively, showing no statistically significant difference ($p=0.505$). The power of the EMG power spectra of the tremor group was significantly superior to that of the control group ($p=0.001$). The comparison of the performance tested with a chi-square test of independence revealed that there is no significant difference in the performance of the tremor group and the control group.

The power spectra of all the subjects were demonstrating 3 clear peaks at the ranges of 2-5 Hz, 6-11 Hz and 18-24 Hz. Similar peaks had been shown to occur in the power spectra of all subjects while pointing a laser beam into a circle in a previous study. The second peak was consistent with physiological tremor in both studies proving that carrom is an activity which enhances physiological tremor. The higher power of the tremor waves in the subjects observed to develop tremor, allowed the visualization of the tremor waves as opposed to the controls.

This study therefore concludes that a tremor develops while playing carrom in approximately one fourth of carrom players. The frequency of the tremor was found to be within the range of physiological tremor, suggesting that this is an enhanced physiological tremor. Tremor was not found to affect the performance.