

Impact of Smoking on Speed and Coordination of Upper Limb Movement

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Short Communication

Abstract

Background: The purpose of this study was to determine the effect of smoking on speed and coordination of upper-limb movement.

Methods: A total of 62 healthy, young individuals were randomly selected for participation in this study. Out of total subjects, 31 were smokers with a mean age 20.84 years and 31 were non-smokers with a mean age 19.97 years and placed in group A and group B, respectively. Plate taping test was administered to all the subjects to determine their speed and coordination of upper limb.

Findings: Student's t-test was applied between both groups to see the difference in their plate taping test's time; its t-value was 5.03.

Conclusion: Statistical significant difference was seen between both the groups in the result of plate taping test, which suggests that smoking can affect the speed and coordination of upper limb in a negative way and cause its deterioration. Therefore, immediate quitting from smoking is of high value and requirements to have a good speed and coordination of upper-limb movements.

Keywords: Smoking, Speed, Coordination, Plate tapping test

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Introduction

In the human body, upper limb plays an important role in day-to-day activities. Its speed and coordination are very essential to perform each and every task from eating food to doing any heavy mechanical work or else we can say, fine motor function to gross motor function. There are so many factors which contribute to the coordinated movement of upper limb. These factors include, nervous control, muscles, bony structure and articulations, in a nutshell we can say that a normal anatomy and physiology is required for proper upper limb's speed and coordination.¹⁻³

Smoking has a negative effect on the human body. We all know that consumption of tobacco may cause cancer. "Tobacco is injurious to health" a well-known quotation of day-to-day life and the warning of its harmful effect on the human body is being regularly mentioned by media and press but still the number of tobacco users is increasing day-by-day.⁴ Tobacco is the most widely used and distributed drug in the world and it also causes more deaths.⁵

Consumption of tobacco can affect cardiovascular system, respiratory system, oral cavity, teeth, etc. its harmful effect on bodily system has been well documented,^{4,7} but there is a paucity of work which found the effect of smoking on speed and coordination, therefore, the purpose of present research work was to find the impact of smoking on speed and coordination of upper-limb movement.

Methods

A total of 62 healthy young, moderately active male individuals were randomly selected for participation in this study. In which 31 participants were cigarette smokers for more than 1 year at a rate of minimum 6 cigarettes/day and

placed in group A, whereas rest 31 subjects were non-smokers and placed in group B. All subjects were devoid of any neuromuscular or psychological disorders. The speed and coordination of upper-limb movement were determined by a "plate taping test" which is a part of "Eurofit Test Battery" and measures upper-body reaction time, hand-eye quickness and coordination. Two discs placed with a distance of 60 cm on a table. A rectangle is placed equidistant between both the discs.

The subjects were required to report at least 30 min prior to the test. Only five participants were allowed to perform the test on a single day. They consumed nothing before the test. Any tight upper-body clothing was removed. Now the participant was asked to place his non-dominant hand over the rectangle and to move his dominant hand back and forth between the discs crossing non-dominant hand as quickly as possible. The participant has to perform 25 full cycles or 50 taps of this test and the time to complete 25 cycles were recorded. Two such trials were taken, and best were recorded.

Mean, standard deviation, standard error, and percentile were used to prepare summary statistics. Student's t-test was used to determine the differences between both the groups. The statistical analysis was done on SPSS for Windows (version 16, SPSS Inc., Chicago, IL, USA).

Results

Group A consists of 31 subjects who use to smoke at least 6 cigarettes/day for more than 1 year, and group B consists of 31 subjects who are non-smokers. The mean age, weight, and height of group A were 20.84 (± 1.98), 61.87 (± 9.75), and 1.66 (± 0.11) respectively; and of group B were 19.97 (± 1.82), 54.61 (± 9.04) and 1.64 (± 0.12) respectively as shown in figure 1.

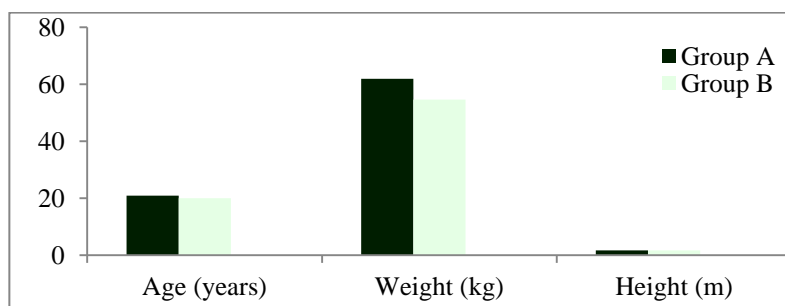


Figure 1. Mean age, weight, and height of participants

Student's t-test were applied between both groups to see the difference in their plate taping test's time, its t-value was 5.03. The time to complete the plate taping test in group A and group B was 22.05 (\pm 3.39) and 18.33 (\pm 2.72).

Discussion

The purpose of the present study was to find the difference in the upper limb's speed and coordination between cigarette smokers and non-smokers. A total of 31 smokers and 31 non-smokers volunteered to participate in the present study and placed in group A and group B respectively. The mean age (years) of all the participants of group A and group B was 20.84 (\pm 1.98) and 19.97 (\pm 1.82) respectively, and their difference was (t-value = 1.80), which found statistical insignificant. Therefore, it can be suggested that the result of this study has not been influenced by the age of subjects from each group. The mean height (m) of all subjects of group A and group B was 1.66 (\pm 0.11) and 1.64 (\pm 0.12) respectively, and its difference was (t = 0.69), which was statistical insignificant, and hence it can also be suggested that height of participants have not influenced the result of this study.

Statistical significant difference was found in the timing of the plate taping test (t = 5.03) between both the groups, which suggests that non-smokers took lesser time to perform plate taping test as compare to the smokers and hence have better

speed and coordination of upper-limb movements, this finding is relatively consistent with the findings of Glassman⁸ and Wolf et al.⁹ which stated that cigarette smoking, impair the coordination function of an individual.

Along with the effect on cardio-thoracic system, cigarette smoking can also cause a decrement on speed and coordination of upper limb.

Conclusion

The findings of the present research study reveal that smoking has a negative effect over speed and coordination of upper limb movements as it causes more time to perform plate taping test than non-smokers. Smoking causes cancer which is fatal and in association with cancer it causes a decrease in speed and coordination which can affect smooth activities of daily life. Therefore, it is advised to all the smokers to immediately quit smoking if they want a healthy and smooth life. Despite social awareness program to eradicate the smoking, a strong policy required to stop the production and availability of such harmful products in the market.

Conflict of Interests

The Authors have no conflict of interest.

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References

1. Flash T, Hogan N. The coordination of arm movements: an experimentally confirmed mathematical model. *J Neurosci* 1985; 5(7): 1688-703.
2. Johnson-Greene D, Adams KM, Gilman S, Kluin KJ, Junck L, Martorello S, et al. Impaired upper limb coordination in alcoholic cerebellar degeneration. *Arch Neurol* 1997; 54(4): 436-9.
3. Ruff RM, Parker SB. Gender- and age-specific changes in motor speed and eye-hand coordination in adults: normative values for the Finger Tapping and Grooved Pegboard Tests. *Percept Mot Skills* 1993; 76(3 Pt 2): 1219-30.
4. Moslemi-Haghighi F, Rezaei I, Ghaffarinejad, Ghaffarinejad F, Lari R, Pouya F. Comparison of Physical Fitness among Smoker and Non-Smoker Men. *Addict and Health* 2011; 3(1-2): 15-9.
5. Makwana NR, Shah VR, Yadav S. A Study on Prevalence of Smoking and Tobacco Chewing among Adolescents in rural areas of Jamnagar District, Gujarat State. *Journal of Medical Sciences Research* 2007; 1(1): 47-50.
6. Foulds J, Ramstrom L, Burke M, Fagerstrom K. Effect of smokeless tobacco (snus) on smoking and public health in Sweden. *Tob Control* 2003; 12(4): 349-59.
7. Kumar N, Sharma S. Effect of Tobacco Chewing on VO2 max. *Sport Medicine Journal* 2011; 3(27).
8. Glassman AH. Cigarette smoking: implications for psychiatric illness. *Am J Psychiatry* 1993; 150(4): 546-53.
9. Wolf PA, D'Agostino RB, Kannel WB, Bonita R, Belanger AJ. Cigarette smoking as a risk factor for stroke. The Framingham Study. *JAMA* 1988; 259(7): 1025-9.

تأثیر سیگار کشیدن بر روی سرعت و تطابق حرکت اندام فوقانی

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مقاله کوتاه

چکیده

مقدمه: هدف از این مطالعه، تعیین تأثیر سیگار کشیدن بر روی سرعت و تطابق حرکت اندام فوقانی بود.

روش‌ها: ۶۲ فرد سالم و جوان به طور تصادفی جهت شرکت در این مطالعه انتخاب شدند. از میان تمام شرکت کنندگان ۳۱ نفر سیگاری (با متوسط سن ۲۰/۸۴ سال) و ۳۱ نفر غیر سیگاری (با متوسط سن ۱۹/۹۷ سال) بودند که در دو گروه A و B قرار داده شدند. آزمون ضربه‌های متناوب به صفحه جهت تعیین سرعت و تطابق اندام فوقانی در همه افراد صورت گرفت.

یافته‌ها: آزمون t جهت تعیین تفاوت در زمان آزمون ضربه‌های متناوب به صفحه انجام شد که مقدار آن ۵/۰۳ به دست آمد.

نتیجه‌گیری: اختلاف آماری معنی‌داری بین دو گروه در آزمون ضربه‌های متناوب به صفحه مشاهده شد و نشان دهنده آن است که سیگار کشیدن می‌تواند بر سرعت و انطباق اندام فوقانی به طور منفی تأثیرگذار باشد و باعث بدتر شدن آن شود. بنابراین توقف سریع سیگار کشیدن دارای ارزش بالا و پیش‌نیاز سرعت و تطابق خوب حرکت اندام فوقانی می‌باشد.

واژگان کلیدی: سیگار کشیدن، سرعت، تطابق، آزمون ضربه‌های متناوب به صفحه

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