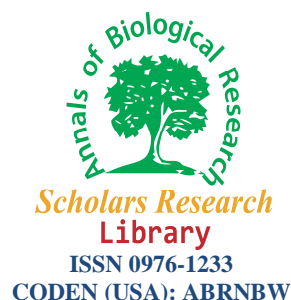




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Annals of Biological Research, 2011, 2 (6):84-87
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Effects of *Mentha piperita* inhalation on VO₂max and reaction time, on man elite karate-do

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ABSTRACT

The purpose of the study was to determine the effect of *Mentha piperita* inhalation on VO₂max and reaction time of man elite karate-do with average age (20.30 ± 6.49) average weight (77 ± 2.90 kg) Average height (175.25 ± 1.94 cm). 20 male athletes voluntarily participated in the study. Regarding the Maximum amount of consumed oxygen obtained from Bruce test results participants divided into two groups of 10 (Experimental and control). Participants of experimental group inhaled the peppermint (pumped in experiment rooming which the 2 ml of pumped peppermint mixed with white alcohol in area of 35m², temperature of 24 c and humidity of 40-55%) and used on reaction time, of male athletes test and then two drops of peppermint odor for Bruce test. Similar tests performed on control group too, but the only difference was that peppermint replaced with white alcohol. To determine the significance of the findings the statically analysis method of T- test was used. Results suggest that there is a meaningful relationship between the administration of *Mentha Piperita* with aerobic performance ($p \leq 0/002$) and reaction time ($p \leq 0/05$).

INTRODUCTION

Good nutrition and use of allowed steroids affect individual function and efficiency. For Example, use of creatine, carbohydrate and Na₂CO₃ supplements enhances functions of speed Athletes [6] or use of HMB supplement (1.5 to 3g/daily) increases strength in non-athlete men and women [8]. However, Erksick suggested that administration of the combined supplements (creatine, carnitin, Q10 coenzyme and colostrums) has increased effect of chest press power in strength exercises [9]. In order to improve the endurance, power, speed and strength, some athletes use steroids drugs and compounds which may cause health problems and side effects in athletes. Recent studies on herbal odors suggested that these compounds have various effects on mental and physical abilities [12], according to psychological tests of Ludvingson and Rottman, drug abuse affects the mood and increases one's alertness and freshness [11]. Atheroleum as a natural ergogenic aid can be used to increase function and performance [17]. Obvious effects on essentials are stimulation of olfactory. Odors greatly affect our feelings and also directly affect the brain. Olfactory system connected to Limbic system which is the control center of

excitement, memory and sexual desires and also involves in the control of heart beat, blood pressure, stress, respiration and hormonal balance. After topical administration or inhalation, these essentials are absorbed in the blood and affect the body[18].Peppermint with its major material, menthol (50%), contains other compounds such as Methyl ester (20%),Menthon (12%), bitter odors and Theanine[2, 3]. Efficient materials of these herbs are used in relaxation of Neural System and treatment of respiratory disorders [4]. In addition to Antibacterial properties, these herbs are useful in treatment of headaches, decreasing excitement and stress and respiratory problems [15]. Peppermint is among drug stimulants, so it stimulates and accelerates the activities of body systems. it also contains Volatile materials which is discharged through respiratory system and stimulates the mucus and facilitates the mucus function and Its discharge facilitates. Recent studies also suggest that these compounds have various effects on individual functions. Several studies reported the positive effects and ergogenic aids along with increased efficiency of athlete associated with the use these compounds [10].For example it is reported that inhalation of peppermint odor would be on stimulant to increase the energy of athletes and non-athletes during exercise [5] or in another study, it is reported that inhalation of peppermint essence while exercising, increases athletes function. However, few evidence exists to support or deny there results. Inhalation of peppermint may be efficient in increasing athletes performance and functions. The study P.Nazarali (ph.d) the response of heart rate \square vo2max \square vo2 minute ventilation and the respiratory exchange ratio to peppermint odor following one bout of exercise in female athlete result Subjects BMI were distinguished and ANOVA showed no significant difference in the mean of BMI of the groups and it showed that inhalation of ambient odor (peppermint essence) doesn't have any significant effect on mentioned variable($p \geq 0.05$) probably for intensity, time of exercise.[19]

MATERIALS AND METHODS

Participants

Twenty healthy university male athlete students voluntarily participated in this study by average age (20.30 ± 6.49), weight (77 ± 2.90 kg) and height (175.25 ± 1.94 cm).

Task procedure

First, reaction time, strength of back muscles and sit-up tests of participants were assessed and then Bruce test was inducted, separately. Regarding the Maximum amount of consumed oxygen obtained from Bruce test results, they were matched randomly into 2 experimental and control groups. Experimental group inhaled 2 ml of peppermint mixed with 2 ml white alcohol in a room of 35m² with 28 C temperature and 45-55% humidity during strength of back and abdominal muscles and reaction time tests, and then two drops of peppermint odor inhaled before Bruce test, for control group the same tests were done except, they inhaled only white alcohol.

Statistical Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 16. T test was used to determine significance between the experimental and control conditions.

RESULTS

After comparing pretest (Vo₂ max), reaction time, back muscle and abdominal muscle strength of experimental and control groups, it was determined that there was no meaningful relationship between the two pre-tests. On the other hand, after ranking process, it is determined that samples are selected from particular community which have similar variance and average. In fact, the homogenous presumption of variances is confirmed. The results showed:

1) Comparing the average difference of pre-test and post-test of Vo_2max in two groups, there was no meaningful relationship between average difference of control and experimental groups ($\alpha \leq 0.001$). On the other hand, inhalation of peppermint odor had meaningful effect on aerobic performance.

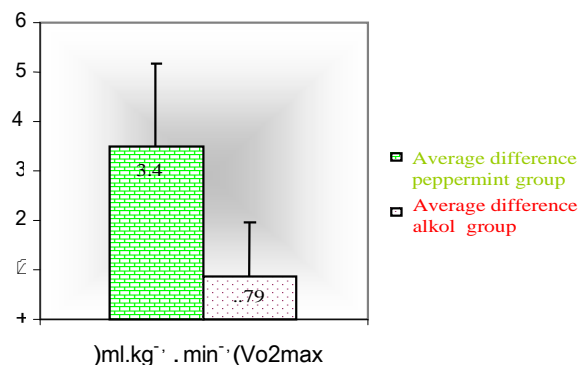


Figure1. Vo_2max average difference in pre-test and post-test

2) Comparing the average difference of pretest and post-test of reaction time in 2 groups and also considering the obtained t and $\alpha \leq 0.005$, there was a meaningful difference between control and experimental groups, i.e., inhalation of peppermint odor has meaningful effects on reaction time of male athletes.

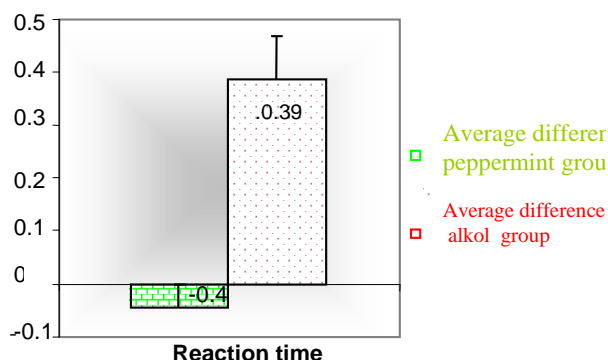


Figure2. Reaction time average difference in pre-test and post-test

DISCUSSION

Results of the current study, confirms with the findings of Barton and Goldberg (1993) and Reudenbaschand et.al (2001) who examined the effect of inhalation of peppermint odor on the Performance of athletes and non-athletes rate during an exercise [16], but is in contrast with the studies of Simon and et.al (2001) who examined the effect of aromatics on physical activities hitch probably is due to fewer participants in Simon and et.al research. In current research, inhalation of peppermint odor increased the aerobic performance of experimental group. According to statically power, the aerobic performance was 82% and considering the standard range, the test was an acceptable performance [14] and regarding peppermint functional mechanism which causes the expansion and relaxation of respiratory muscles in contraction state and also affects the opening of upper respiratory tracts and regulation of cardiopulmonary system, confirms with the current results [7]. The results of the study confirms with findings of

Reudenbasch and et.al (2001) who examined the effects of inhalation of aromatics of peppermint odor on athletes performance, but in contrast with findings of Mill at and et.al (2002) who examined the aromatics effects on reaction time [12]. However, the results of the study confirms with findings of Barton and Goldberg (1993) who examined the inhalation of peppermint odor on functional rate of athletes and non-athletes during exercise. Investigating the average pretest and post-test of reaction time, it is determined that average reaction time increased compared to pre-test and the result was statistically meaningful. On the other hand, inhalation of 1mm of peppermint odor caused meaningful increase in reaction time of participants ($p \leq 0.011$). However, comparing pre-test and post- test, reaction time in control group increased, which indicates that inhalation of 2ml of white Alcohol wouldn't cause meaningful increase in reaction time of participants ($p \leq 0.179$). However, decrease in reaction time of experimental group may be due to the effects of peppermint odors on neural system which these odors may cause relaxation and Decreased stress and result in decreased heart beat during maximum activities. In the current Study, inhalation of peppermint odors increased the aerobic performance in experimental group, but the functional mechanism of these aromatics is uncertain.

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