

Effects of Coffee on Cognitive and Balance Performance

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Abstract. This study investigated the effects of coffee on cognitive and balance performance. Eleven healthy students, aged between 22-29 years, participated. Participants attended two sessions, baseline (the cognitive test -Mirror tracing test/ MMSE test) and experimental (the balance test -CTSIB). Participants were given one cup of brewed coffee (180 mg caffeine), after 25 minutes, the cognitive and balance test were taken. The results demonstrated that consuming caffeine significantly reduced the number of errors and time spent for tracing the star, and also the MMSE score was significantly higher but no significant difference was found for balance test.

1. Introduction

Average caffeine consumption in the USA is approximately two cups of coffee (200 mg) per day [1]. Coffee is a widely consumed beverage which has positive impact in daily life as suppression of fatigue, increasing alertness, energy and ability to concentrate. The main dietary sources of caffeine are coffee, chocolate, tea, cola drinks and energy drinks which is also consumed as over-the-counter medicine to reduce tiredness and increase mental alertness [2]. The study on a moderate dose of caffeine and cognitive performance during a fatiguing motor task shows that caffeine improved cognitive task performance in both the single and dual task and decreased reaction times. Furthermore, other issue represent in this study is related to balance which plays a crucial role in almost all sport events, either in shooting which involve less movements or dynamic sports such as gymnastics and wrestling which require agility in combination with maximum balance [3]. The purpose of the study is whether coffee consumption has any effect on cognitive and balance performance.

2. Experiment, Results, Discussion, and Significance

The principal part of the arguments is to investigate whether coffee consumption has positive effect on cognitive and balance performance among college students. Eleven healthy participants (7 male/ 4 female) aged between 22-29 years, were recruited from Master students of exercise science department at WSU. General questionnaire and consent form has been filled out by each participant. Each participant attended two sessions [baseline and experimental (caffeine)]. In the first session, cognitive test (Mirror tracing test/MMSE test) and balance test (CTSIB) had been taken. On experimental day participants were asked to consume one cup of brewed coffee (oz.) that contain 180 mg caffeine, and after 25 minutes the cognitive and balance test had been taken. Difference between baseline and experimental scores were considered to be significant if $p < 0.05$. All data had been analysis by SPSS version 17.0 for Windows. The results of cognitive test demonstrated that caffeine consumption significantly affected the result of mirror tracing test which showed experimental group had significantly lower error than baseline group ($p=0.004$), also the amount of time for tracing the star was significantly lower in experimental than baseline($p=0.044$).

Moreover, after consuming coffee participants showed significantly higher score for MMSE test ($p=0.026$). The results of balance test indicated that, there was no significant difference between baseline and experimental group in all categories of CTSIB tests [stability eyes open firm ($p=0.511$)/ stability eyes close firm ($p=0.342$)/ stability eyes open foam ($p= 0.549$)/ stability eyes closed foam ($p= 0.634$)]. Lots of researches show that caffeine consumption has positive effect on cognitive and psychomotor performance such as alertness, energy, ability to concentrate [4,5]. Athletes are among the groups of people who are interested in the effects of caffeine on endurance and exercise capacity. It has been proved that caffeine leads to reducing fatigue and increasing wakefulness and alertness for many centuries [6]. Caffeine supplementation on sport performance has positive effect, depends on various factors including, but not limited to, the condition of the athlete, exercise (i.e. mode, intensity, duration) and dose of caffeine [7,8].

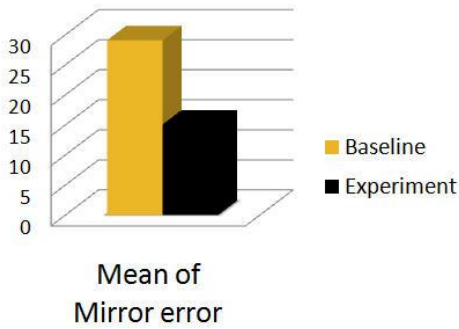


Figure1. Mean of Mirror tracing test

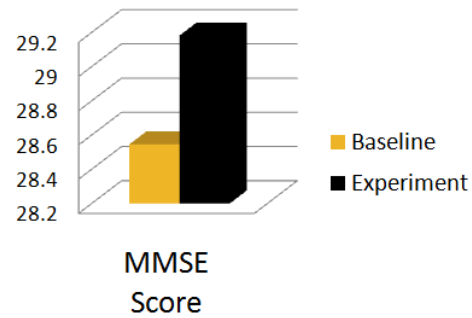


Figure2- MMSE Score

3. Conclusions

Results from this study suggest that consuming coffee has positive effect on cognitive performance but it does not have any impact on balance performance.

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