## P17 PHARMACOKINETICS AND THE EFFECTS ON PSYCHOMOTOR PERFORMANCE OF CAFFEINE IN ENERGY DRINKS IN THAI HEALTHY VOLUNTEERS

Dumrongsak Pekthong[1], Kampon Sriwatanakul[2], Krongtong Yoovathaworn[2], Kittima Sriwathanakul[2]

*[1]Faculty of Pharmaceutical Science, Naresuan University, [2]Department of Pharmacology, Faculty of Science, Mahidol University,*

## ABSTRACT

Caffeine is a widely consumed psychoactive substance found in a variety of beverages, foods, and medicines. In Thailand, the effects of caffeine on general health of laborers have been considered as one of the health problems. However, the safe limit of consumption per day is not generally well accepted. The purpose of this study was to determine the pharmacokinetic parameters of caffeine in popular energy drinks and its effects on psychomotor performance. The pharmacokinetic studies in 12 healthy male subjects indicated $C_{max}$ = 5.45±0.57 □g/ml, $T_{max}$ = 0.92±0.39 hr, $t_{1/2}$ = 4.57±0.37 hr. $AUC_{0-8}$ and $AUC_{0-□}$ values were 26.04±4.28 and 38.94±8.41 □ g.hr/ml, respectively. Vd was 0.60±0.12 L/kg and CL was 1.53±0.31 ml/min.kg. It was suggested that caffeine is rapidly absorbed and distributed throughout the body. It is also rapidly eliminated from the body. To investigate the effects of caffeine on psychomotor performance by determining changes over the pre-dose reaction time (RT) of the simple reaction time (SRT) and choice reaction time (CRT), another 12 subjects received placebo, 200 mg and 400 mg of caffeine in a crossover study. It was found that the administration of low dose of caffeine (200 mg) improved performance as the increment over the pre-dose values of SRT, 3CRT, 6CRT and 9CRT were significantly different from placebo ($p<0.05$). High dose of caffeine (400 mg) produced less performance enhancement than that of the lower dose. The peak performance was observed around 1.5-2 hr with the lower dose, whereas the peak was generally observed between 0.5-1 hr with the higher dose of caffeine. About 65 % of subjects in this study complained of palpitation, nervousness and restlessness after taking 400 mg of caffeine, which none of the subject taking 200 mg of caffeine reported any adverse effects. The overall findings of the present study did not implicate the adverse effects of a single dose administration of 200 mg of caffeine containing in the popular energy drinks in the Thai healthy male subjects. It is reasonable to assume that the consumption of caffeine-containing beverages not exceeding 200 mg of caffeine per day should not pose a serious health risk to the Thai population at large. However, long term intake of caffeine should be rigorously assessed using well-controlled studies in order to determine the long-term effects of caffeine consumption on human health.