

## THE EFFECTS OF PERIODIZED COMPLEX TRAINING PROGRAMME ON MILITARY PHYSICAL FITNESS AND FIGHTING ABILITY

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### INTRODUCTION

Complex training is a way to develop muscle strength, speed and technique, simultaneously [1]. This study is planned to examine the effects of periodized complex training method by comparing the basic physical fitness and fighting ability improvements before and after the training sessions in order to confirm the practical use of periodized complex training in military training promotion.

### METHODS

The training program includes one hour of training per day, five days per week, and a total of twelve week. Thirty subjects were randomly assigned to either the control group (n=15) or the experimental (n=15) group. These subjects were currently serving more than six months in the military. A Kistler Quattro Jump force platform system (Kistler 9290AD, Switzerland) and the Biodex System 3 isokinetic dynamometer (Biodex Systems Inc. Shirley, New York) were used in this study to observe the jumping performance and work output from the isokinetic dynamometer, respectively.

### RESULTS AND DISCUSSION

In this experiment, the upper extremity muscle strength and muscle endurance tests after twelve weeks of physical trainings that include 60 seconds of pull-up, total work of ten repetitions of isokinetic shoulder flexion/extension at 60° and 180°/sec, both experimental and control groups showed significant improvements after the sessions. However, other than pull-ups, the improvement rates differ significantly between the two groups as experimental group is substantially higher than control group. Although the improvement rates in isokinetic muscle strength at 60° and 180°/sec are greater in experimental group than that of control group, there is no significant difference between the two, reflecting insufficiency of upper extremity training in the routine. In abdomen muscle endurance (60 seconds of sit-up) tests, the improvement rates showed significant differences of 8.17% and 4.93% in experimental and control group, respectively. The experimental group is substantially higher than control group. The lower extremity jumping tests showed 10.92% and 5.59%

of significant explosiveness improvement rates in experimental and control group, correspondingly. On the other hand, the muscle endurance improvement rates showed no significant difference between experimental (10.01%) and control (9.43%) group. According to above-mentioned results, we found that the improvement rates for both lower extremity explosiveness and muscle endurance in experimental group are similar. However, the improvement rates in control group are 5.59% and 9.34%, respectively. It revealed that the effects of periodized complex training method are more profound in promoting lower extremity explosive force than in muscle endurance. Furthermore, the influence of twelve-week physical training on cardiopulmonary endurance is shown in the scores of 3000-meter run and bleep-test (indirect VO<sub>2</sub>max estimation), where average improvement rates of experimental groups are significantly higher than control group. These results reflected the Fartlek training method used in our physical training program, applying various training velocity in uphill, downhill and stepping exercising modes, could directly elevate the cardiopulmonary performance in exercises. The study also reveals that under fighting ability categories of basic grenade throwing and 500-meter obstacle run the improvement rates are both significantly greater in experimental group than control group. Regression equation demonstrated that shoulder isokinetic muscle strength at 60°/sec and abdomen muscle endurance are factors determining basic grenade throwing scores. Furthermore, shoulder isokinetic muscle strength at 60° /sec, abdomen muscle endurance and the VO<sub>2</sub>max are directly related to performances of 500-meter obstacle race.

### CONCLUSIONS

In this study we found a close relationship exists between military physical fitness and fighting ability. Simply follow our training program and military people will soon get fitness and wellness results.

### REFERENCES

1. Wilson, G.J., et al., *Med. Sci. Sports Exerc* **25**, 1279-1286, 1993.