The Efficacy of Denshichi-Tochusei (DTS) on Exercise Performance Enhancement (open study)

Project Dates: Start Date: Fall 2002
Completion Date: Winter 2003

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Brief Overview:
10 healthy subjects will be supplemented with a proprietary herbal supplement for 4 weeks, to assess effect on exercise performance. The main outcome measures will be blood pressure during sub-maximal exercise, heart rate during sub-maximal exercise, perceived exertion during sub-maximal exercise, time to exhaustion at maximal exercise, blood lactate and post exercise recovery.

Background and Justification:
Many products exist on the market with purported ergogenic effects for athletes. One of the most studied herbs for human physical performance is ginseng (1), and its benefits include increased aerobic work capacity. The mechanisms by which ginseng may increase human performance is not clear, suggestions have been made that ginseng increases the production of cortisol or that it enhances the ability of muscles to extract oxygen from the blood, although there is no scientific evidence to support these claims. Scientific studies show mixed results both in terms of the ability of ginseng to increase exercise performance, as well as which group may yield the most benefit, the well-trained person vs. the average person. At least one study does, however, suggest that ginseng may work better in persons who are not extremely fit to begin with (2). Denshichi-Tochisei (DTS) is a proprietary product containing a mixture of Panax pseudoginseng, Ginseng radix, Eucommia ulmoides and honey. This product has been suggested to increase exercise performance in humans.

Objectives:
This pilot study aims to determine whether supplementation with DTS can increase exercise performance in healthy adults.

Hypothesis:
Maximal oxygen uptake, blood pressure during sub-maximal exercise, heart rate during sub-maximal exercise, perceived exertion during sub-maximal exercise, oxygen consumption during sub-maximal exercise, as well as time to exhaustion, blood lactate and post exercise recovery will be altered in healthy adults.

Methodology:
Ten male or female adults (18-40) who fit the attached inclusion/exclusion criteria will be recruited. At the study start participants will undergo a VO_2 max test. A minimum of 72 hours later, subjects will ride a bicycle ergometer in order to familiarize themselves with the trial, at 70% VO_2 max for 60 minutes. Subjects will be asked to refrain from consumption of caffeine prior to exercise. After 60 minutes, cycle intensity will increase to 95% VO_2 max and subjects will ride to exhaustion. Time to ride to exhaustion will be determined. One week later, subjects will have blood taken to determine lactic acid levels and liver function. Subjects will ride a bicycle ergometer at 70% VO_2 max for 60 minutes. Again, subjects will be asked to refrain from consumption of caffeine prior to exercise. During the ride (0,15, 30, 45 and 60min) blood pressure, heart rate, oxygen consumption, rating of perceived exertion and respiratory exchange ratio will be determined. After 60 minutes, cycle intensity will increase to 95% VO_2 max and subjects will ride to exhaustion. Time to ride to exhaustion will be determined. Blood will be taken for determination of blood lactate upon cessation of cycling. Post exercise recovery will be determined by measuring heart rate, blood pressure and oxygen consumption at 5 min and 10 min after ride completion. Subjects will consume 2 g DTS powder 3 times per day. After 4 weeks subjects will return and have blood taken to determine lactic acid levels and liver function. Subjects will again ride the bicycle ergometer as stated previously. Subjects will be requested to consume the same foods/ drinks and amounts preceding each exercise bout.

Inclusion Criteria:

- Both sexes
- Aged 18-40
- Non-competitive athlete
- Non-sedentary
- Exercise between 3-5 endurance sessions per week
- 45 ml/kg/min < VO_2 max < 60 ml/kg/min
- Non-smoker

Exclusion Criteria:

- Pregnancy
- Respiratory infection within past 3 weeks
- Use of other herbal treatments
- History of serious allergy to any medications
- History of any serious gastrointestinal, hepatic, renal, cardiovascular, neurological or hematological disorder
- History of psychiatric disorders which may impair the ability of subjects to provide written informed consent
- History of drug dependence or chronic heavy alcohol use
- Participation in any clinical trial within 6 weeks preceding day 1 of study

References:

1. Bucci (2000) Am. J. Clin. Nutr. 72 (suppl):624S-636S
2. Pieralisi et al. (1991) Clin. Ther. 13 (3):373-382.

Open Study of DTS on Exercise Performance

N=10

Visit	Screen	VO_2 max	Practice	Baseline	4 week
Informed consent	X				
VO_2 max		X			
During ex- O_2 consumption			X	X	X
Perceived exertion			X	X	X
During ex- blood pressure				X	X
During ex-heart rate				X	X
Perceived exertion				X	X
Post ex-blood pressure				X	X
Post ex-heart rate				X	X
Post ex-oxygen consumption				X	X
Blood Lactate				X	X
Lactic Acid /Liver Function Tests				X	X