

6. Nervous System Diseases (including Alzheimer's Disease)**References**

Zhuang H.Y., Kim Y, Kurachi M, et al. Effect of Kakkon-to on sleepiness after sleep deprivation of normal young adults. *Shinkei Seishin Yakuri (Japanese Journal of Neuropsychopharmacology)* 1992; 14: 319–25 (in Japanese with English abstract). Ichushi Web ID: 1994094031

Hagino H, Kim Y, Kurachi M, et al. Effect of Kakkon-to on sleepiness after sleep deprivation with quantitative EEG method. *Noha to Kindenzu (Japanese Journal of Electroencephalography and Electromyography)* 1995; 23: 361–7 (in Japanese with English abstract).

1. Objectives

To evaluate the effect of kakkonto (葛根湯) on sleepiness after sleep deprivation.

2. Design

Double blinded randomized cross-over controlled trial (DB-RCT-cross over).

3. Setting

Department of Neuropsychiatry, Toyama Medical and Pharmaceutical University Hospital, Japan.

4. Participants

Seven healthy female students (aged 20 or 21 years).

5. Intervention

Arm 1: oral administration of Kanebo Kakkonto (葛根湯) Extract Granules 2.5 g t.i.d. before meals on day 2 of the experiment. After one month of washout, oral administration of placebo (lactose) 2.5 g t.i.d. before meals on the second day of the experiment (n=3).

Arm 2: oral administration of placebo (lactose) 2.5 g t.i.d. before meals on day 2 of the experiment After one month of washout, oral administration of Kanebo Kakkonto (葛根湯) Extract Granules 2.5 g t.i.d. before meals on day 2 of the experiment (n=4).

6. Main outcome measures

Subjective sleepiness (Sleepiness Scale), Critical Flicker Frequency (CFF), Multiple Sleep Latency Test (MSLT), blood pressure, heart rate, body temperature, and electroencephalogram (EEG).

7. Main results

An hourly comparison revealed significantly less subjective sleepiness in arm 1 than in arm 2 at 10:00 a.m. on day 2 of the experiment ($P<0.05$). No between-arm differences were found in the mean values for CFF, MSLT, subjective sleepiness, blood pressure, heart rate, and body temperature. The mean latency in the MSLT value was significantly longer in kakkonto group than in placebo group ($P<0.05$). The calculated relative power contribution ratio at each frequency band was reported significantly lower $\% \delta$ at 16:00 and 18:00 and significantly higher $\% \alpha$ at 16:00 in the kakkonto group than in the placebo group.

8. Conclusions

Kakkonto is effective for relieving sleepiness after sleep deprivation.

9. From Kampo medicine perspective

None.

10. Safety assessment in the article

Not mentioned.

11. Abstractor's comments

This is an excellent clinical study report by Zhuang et al (1992) investigating the effect of kakkonto on sleepiness after sleep deprivation using a cross-over design and subjective sleepiness and objective measures, e.g., EEG, for evaluation. However, as discussed by the authors, kakkonto was deemed effective on the basis of different measures at different hours, making sleepiness difficult to evaluate. In addition, the attempts to blind the participants to treatment allocation, including administration with a soft drink, were inadequate. Ideally, encapsulation should have been used. Significant differences in some measures have been shown in a larger sample size. Nevertheless, this is an interesting report elucidating the efficacy of a Kampo medicine. The original article by Hagino et al (1995) included an analysis of EEG results..

12. Abstractor and date

Goto H, 19 August 2008, 1 June 2010, 31 December 2013.