

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Human Health : Countermeasures (2)

Author: Prof. Satoshi Iwase
Aichi Medical University, Japan, s_iwase@nifty.com

EFFECTIVENESS OF DAILY LOADING OF ARTIFICIAL GRAVITY AND ERGOMETRIC EXERCISE AS A COUNTERMEASURE IWASE S, SUGENOYA J, NISHIMURA N, SATO M, SHIMIZU Y, KONIKOWSKA D, TAKADA H, TAKADA M, MANO T, ISHIDA K, AKIMA H, HIRAYANAGI K, KATAYAMA K, ISH

Abstract

Effectiveness of centrifuge-induced artificial gravity and ergometric exercise as a countermeasure to space deconditioning, induced by 20 days of head-down bedrest., was examined in 12 healthy men in 2006, and 8 healthy men in 2007. Bedrest was performed with 2300 kcal of diet, and water intake was encouraged more than the urine volume in a previous day. The protocol for artificial gravity with ergometric exercise was adopted, with 1.6 G of artificial gravity at heart level and 60 W of exercise every day (ECM) and alternate day (ACM). The load was continued until 30 min cumulative total load time. Gravity was stepped up by 0.2 G or exercise load was stepped up by 15 W alternately when the subject endured the load for 5 min. Gravity tolerance was examined with centrifuge by anti-G score. RESULTS: 1) Orthostatic tolerance: ECM could suppress the bedrest-induced orthostatic intolerance. 2) Circulating blood volume: ECM showed no significant difference in the circulating blood volume, whereas CONT decreased by 5