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Author: Dr. Evgeny Bersenev

Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation,
bersenev_evgenii@mail.ru

Prof. Gennady Kovrov

Russian Federation, kgv2006@yandex.ru

Dr. Ukraintseva Yulia

Russian Federation, ukraintseva@yandex.ru

Dr. Posokhov Sergey

Russian Federation, psv159@yandex.ru

Dr. Galina Vassilieva

SRC RF Institute of Biomedical Problems RAS, Russian Federation, galvassilieva@mail.ru

Mr. Josef Yakhya

SSC RF Institute for bio-medical problems RAS, Russian Federation, josef.imbp@gmail.com

Mrs. Grechkovskaya Dariya

Russian Federation, d.grechkovskaya@gmail.com

Mr. Konstantin Pikalov

Russian Federation, kos-p@yandex.ru

Mr. Artemy Orlov

Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation,
orlovartem@mail.ru

Dr. Elena Tomilovskaya

Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation,
finegold@yandex.ru

Dr. Ilya Rukavishnikov

Institute of Biomedical Problems, Russian Academy of Sciences, Russian Federation,
sapsan.box@gmail.com

Prof. Oleg Orlov

Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation,
orlov@imbp.ruCHANGES IN THE NIGHT SLEEP ARCHITECTURE AND BLOOD PRESSURE DURING 21-DAY
DRY IMMERSION**Abstract**

It is known that night sleep is disturbed both in space flight and its ground-based models, however, studies on this topic are few, and the mechanisms of these disturbances remain unclear. The model of Dry Immersion (DI) reproduces the effects of microgravity which is characteristic of the first days of astronauts' stay in zero gravity. Probably first few days back pain syndrome of DI can affect sleep patterns and hemodynamic regulation. Polysomnographic studies (PSG) during DI have never been performed before. We study the effect of 21-day DI on all-night PSG characteristics and blood pressure

(BP) values. The study involved 10 male volunteers, age 29.3 ± 3.5 years (M \pm -SD). PSG studied under standard protocol was carried out at night immediately before DI and during DI at nighttime, on the 3rd, 10th and 19th days of DI, and one day after its end at the time from 22.00 to 09.00. BP data were recorded with 24-hour blood pressure monitor. The saliva samples of cortisol were also collected. The PSG data disorganization shown at the 3rd day of DI: compared with the background session, the number of awakenings significantly increased, the duration of wakefulness (W) at night hours grew, and the effectiveness of sleep (SE) decreased. In addition, on day 3, the duration of the rapid eye movement (REM) stage and (NREM) 2 stage significantly decreased. Both on 10th and 19th of DI, signs of recovery of sleep characteristics were revealed, and the main values of sleep architecture were comparable to the background ones. During DI significantly increased the duration of the REM. One day after the end of DI, the duration of the REM stage returned to its initial values. Considering the neuroprotective properties of REM and its important role in the processes of brain recovery, it can be assumed that the increase in the duration of REM is associated with the processes of adaptation to DI. Hypokinesia during DI can lead to an increase the REM probably activate of the production of heat shock proteins (molecular chaperones) and possible metabolic changes. In DI tendency of BP nighttime variability decrease was observed. The BP data displayed the greatest rise both systolic and diastolic BP detected on the 3rd night and progressive fall to 10th and 19th of DI. The cortisol data didn't reveal any significant changes in the course of DI. The study is supported by the RAS (63.1, 64.1, 65.1).