Ocular Outcomes Comparison Between 14- and 70-day Head-down Tilt Bed Rest

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BACKGROUND

• Ophthalmological changes have been recently reported in some astronauts involved in long-duration space missions:
  - Elevated intracranial pressure resulting from µG-induced cephalad fluid shifts; may be responsible for most of these findings
  - Head-down tilt bed rest (HDTBR) produces cephalad fluid shifts; used to simulate the effects of µG on the human body

PURPOSE

• To compare structural and functional ocular outcomes between 14- and 70-day HDTBR in healthy human subjects.
  - Hypothesis: 70-day HDTBR induces ocular changes of greater magnitude as compared to 14-day HDTBR

METHODS

• Two integrated, multidisciplinary studies conducted at NASA Flight Analogs Research Unit (FARU): 14- and 70-day 6º HDTBR
• NASA standard HDTBR screening procedures (healthy adults)

NASA bed rest studies STANDARDIZED CONDITIONS

✓ Subject to rest in bed at all times
✓ Monitoring by a subject monitor and an in room camera
  24 hrs a day
✓ Daily measurement of vital signs, body weight, fluid intake and fluid output
✓ No napping permitted between 6:00 am and 10:00 pm
✓ Standardized diet

NASA Flight Analogs Research Unit (FARU)

70 days HDTBR Duration 14 days

YES 2 office visits

OCULAR EXAMS:

YES Weekly (FARU)

YES 1 office visit

YES

RESULTS

• Pre/post-HDTBR differences in near visual acuity, spherical equivalent, IOP and SD-OCT average RNFL thickness were compared between the two studies

CONCLUSIONS

• The two studies displayed a similar pattern of post-HDTBR changes, but there were no significant pre/post-HDTBR differences between 14- and 70-day HDTBR for the structural and functional ophthalmological variables evaluated

SUPPORT

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DISCLOSURE

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