ABSTRACT

Objective: Evaluation of off-vertical axis rotation for motion sickness prophylaxis

Study Design: Randomized, prospective double blind

Setting: Vestibular research laboratory

Patients: 12 patients, 7 male, 5 female, ages 21 to 57, normal auditory/vestibular function

Intervention(s): Off-vertical axis rotation 20 degrees in the dark after administration of transdermal-scopolamine or placebo. Also, off-vertical axis rotation 20 degrees in the dark without drug administration, varying the speed of the rotational chair.

Main Outcome Measures: Duration of tolerated off-vertical rotation; subjective symptom reporting during rotation at one-minute intervals on a 0 to 4 scale.

Results: Patients treated with transdermal scopolamine had statistically significant improved tolerance time to off-vertical axis rotation. Reported symptomatology on the 0-3 subjective symptom scale was significantly improved as compared to placebo and was dose-dependent. Our group also found that motion sickness onset is shortest at a chair rotational velocity of 0.285 Hz on the average.

Conclusions: Off-vertical axis rotation is a useful modality for the evaluation of motion sickness medications. Transdermal scopolamine showed statistically significant dose-dependent effects in mitigating OVAR-induced motion sickness symptomatology and was well tolerated. Motion sickness onset is shortest at a chair rotational velocity of 0.285 Hz on the average. This indicates the most efficient speed at which to test motion sickness susceptibility and prophylaxis.

Key Words: Off-vertical, vestibular, motion sickness, scopolamine, rotational

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Reprints

Off-Vertical Axis Rotation (OVAR)

- Primarily used in previous studies for the quantitative measurement of vestibular function such as VOR (Wall)
- Present study is qualitative assessment of OVAR as a convenient “motion sickness generator”

Subjective reporting scale:
0: No abnormal sensations
1: Abnormal sensations that do not cause discomfort, such as dizziness, perspiration and stomach awareness.
2: Mild discomfort which is noticeable but is not distracting
3: Moderate discomfort which can be tolerated indefinitely but is distracting
4: Severe discomfort which cannot be tolerated indefinitely or vomiting.

Results

Subjects treated with transdermal scopolamine had statistically significant improved tolerance time and symptomatology to off-vertical axis rotation. This effect was dose-dependent.

Conclusions

- Off-vertical axis rotation is a useful modality for the evaluation of motion sickness medications.
- Transdermal scopolamine showed statistically significant dose-dependent effects in mitigating OVAR-induced motion sickness symptomatology and was well tolerated.
- Further research using OVAR to evaluate other methods to mitigate motion sickness is indicated.

References