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Is Regression Gain or Instantaneous Gain the most reliable and reproducible gain value when performing video Head Impulse Testing of the lateral semicircular canals?

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Introduction
With the advancement of vestibular testing modalities, the video Head Impulse Test (v-HIT) has earned a prominent place in the clinical setting. It is now possible to test all of the semi-circular canals (SCCs) fast and efficiently. The v-HIT systems provide information about the function of the vestibular ocular reflex (VOR) by means of two modalities: SACCADES and GAIN (the ratio between eye and head velocities). The EyeSeeCam® v-HIT system presents the gain value as:

• Regression gain (a best fitted line through the data plots)
• Instantaneous gain value at 40, 60 and 80ms. (The mean value at specific latencies)

Objective
Primary endpoint:
• Is instantaneous gain or regression gain the most reproducible and reliable gain value when performing v-HIT with testing of the lateral SCCs?

Secondary endpoints:
• Comparison of each of the instantaneous gain values at 40, 60, and 80ms with the regression gain values of the lateral SCCs.
• Investigate any intra- and inter examiner variability when comparing gain values between an inexperienced and an experienced neurootologist.

Materials
The v-HIT system -EyeSeeCam® from Interacoustics, Denmark, was used to perform the v-HIT tests on all lateral SCCs.

Methods
60 subjects between 18-65 years without any prior history of vestibular disease were included. Prior to inclusion all subjects filled out a questionnaire as well as a Dizziness Handicap Inventory (DHI). All subjects underwent two complete v-HIT test sessions by an experienced neurootologist.

Results
When testing the lateral SCCs we found that the regression gain was the most reproducible gain value when comparing it with instantaneous gain.

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When testing the lateral SCCs we found that the regression gain was the most reproducible gain value when comparing it with instantaneous gain.

Conclusion
• Regression gain is more reproducible than instantaneous gain.
• 40ms is the least reproducible of the instantaneous values.
• No significant intra or inter examiner variability (experienced/inexperienced)

References

All subjects underwent two complete v-HIT test sessions by an experienced and an inexperienced examiner respectively. The order of the examiners and the sequence of the SCC being tested were randomized.

Results
When testing the lateral SCCs we found that the regression gain was the most reproducible gain value when comparing it with instantaneous gain.

Authors declare no conflicts of interest. Contact info: chlaj@rn.dk

Fig. 1 Report after lateral SCC testing of a person without vestibular pathology depicting both Instantaneous and Regression gain.

Fig. 2 Trial profile

Fig. 3 Mean standard deviation of the different gain types.

Fig. 4 Standard deviations of the different gain types performed by the experienced/inexperienced doctor.

Fig. 5 Mean standard deviation of the different gain types.