P530

VERTIGO AND BALANCE DISORDERS

Can we differentiate a “conductive” from a “sensorineural” VOR impairment on vHIT? Superior canal dehiscence VS acute vestibular loss

A. Castellucci [1], S. Martellucci [2], P. Malara [3], M. Alfarghal [4], E. Armato [5].

[1] AUSL-IRCCS di Reggio Emilia, Italy, [2] AUSL di Latina, Italy. [3] Centromedico, Bellinzona, Switzerland, [4] King Abdulaziz Medical City, Jeddah, Saudi Arabia, [5] University of Padova, Italy.

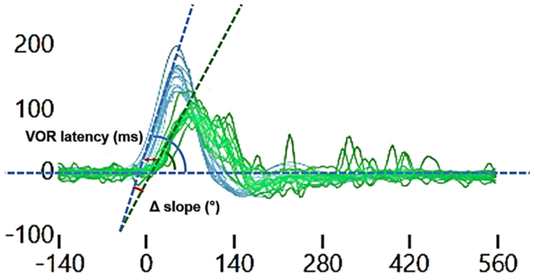
Background

The **video-head impulse test (vHIT)** represents an accurate device for the measurement of the semicircular canal **vestibulo-ocular-reflex (VOR).** Specific **lesion patterns** have been detected in several vestibular disorders **depending on the underlying pathomechanism and etiology**. The **morphology of the slow-phase VOR for the hypoactive canals at the vHIT** has not been analyzed yet. A **phase-shift (or phase-lag) of the VOR** at the vHIT has been generally attributed to **artifacts**.

In **acute unilateral vestibulopathy (AUVP),** a neural inflammation or an ischemic damage of vestibular sensors leads to a **reduced activity of the affected neuroepithelium (“sensorineural” VOR-gain impairment).** Conversely, **superior canal dehiscence (SCD)** can generate a selective VOR-gain impairment for the dehiscent canal likely through an **endolymphatic flow dissipation** via a low-impedance pathway due to the dehiscence **(“conductive” VOR-gain impairment)**, consistent with the **“third-window mechanism” (TWM).**

Materials and Methods

vHIT data of **10 patients with SCD with TMW symptoms** and VOR-gain impairment for the dehiscent canal and **10 patients with a history of AUVP** exhibiting matched VOR-gains for the affected canals were retrospectively analyzed. **Latency (ms)** and the **difference between the slope of the head trace and the slope of the slow-phase VOR (Δ slope, °)** or the affected and healthy canals were measured and compared.

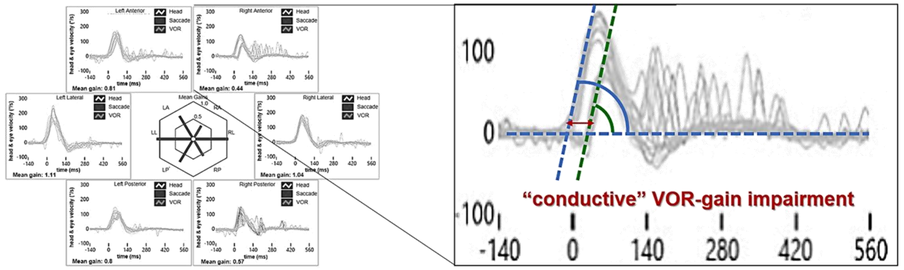


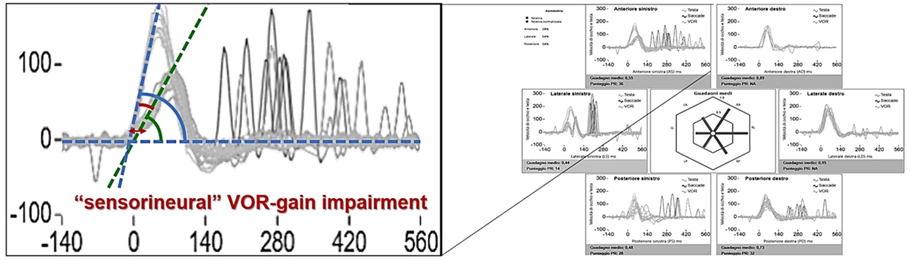
Aims

This preliminary study aims to assess the possibility to **distinguish a “conductive” from a “sensorineural” VOR gain impairment depending on the underlying pathomechanisms, analyzing the morphology of vHIT-traces.**

Conclusions

The **different morphologies** of vHIT traces might not be due to artifacts, but rather could give **new insights into the pathomechanisms underlying the VOR impairment**, shedding lights into **new possible applications for the vHIT**.



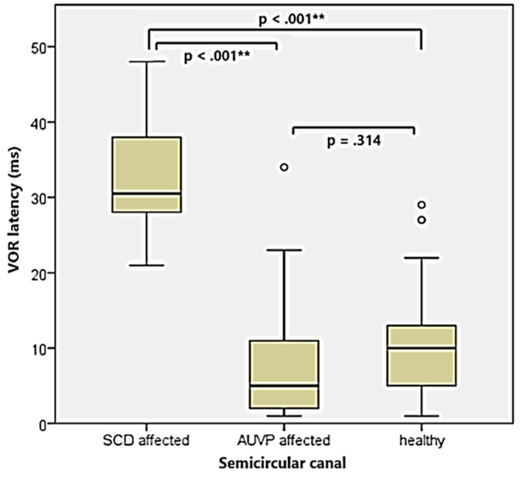


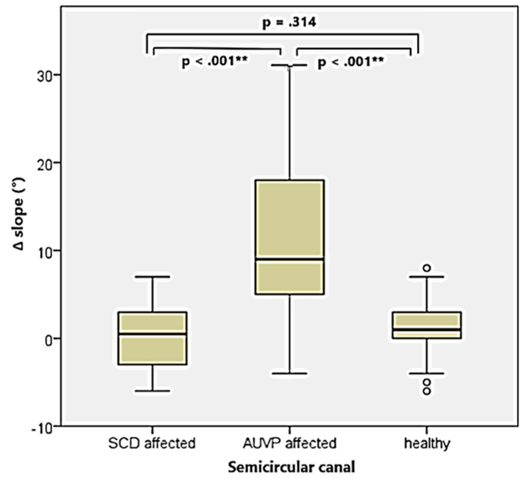
Further studies with **larger and different cohorts** (including patients with Meniere’s disease, vestibular schwannoma, and other inner ear disorders leading to VOR-gain impairment) **will be needed to confirm our findings.**

Results

Canals affected in SCD exhibited significantly **higher VOR latencies** and **lower Δ slopes compared to the affected canals in AUVP** subgroup, revealing **different pathomechanisms underlying the development of the VOR-gain impairment**.

VOR-latencies of the **canals affected in SCD** were significantly **higher** also **compared to healthy canals**, while **Δ slopes** of the **canals affected in AUVP** were significantly **higher than healthy canals.**





19-22 September 2024
Paris, France
CNIT Paris La Défense