**Remarks to vertigo and the risk of falls after cochlear implantation**

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Introduction: A potential secondary effect after cochlear implantation (CI) is the development of vertigo and possible risk of falls. In view of extended indications and increasing age of patients, the development of vertigo is a relevant factor for postoperative management. This presentation provides an overview of our studies on vertigo after CI and the actual findings to risk of falls after CI.

Methods: In our CI Center we reviewed the results of the latest study about vertigo after CI in comparison to our studies within the last 10 years. In a further prospective clinical study concerning risk of falls we included 20 adult CI candidates. Postural control and stability were assessed using the mobile posturography device (Vertiguard®). The posturography determines the body sway forward-to-backward as well as side-to-side in degrees per second. The patients underwent with the device before surgery and 3-5 days after, the Standard Balance Deficit Test or the geriatric Standard Balance Deficit Test (for patients older than 60 years) protocol. The risk of falls was calculated in comparison with age- and gender-specific norm values.

Results: The current results about vertigo after CI show a reduction of vertigo frequency after surgery of more than 30%. Using the standard soft surgery technique, with a round window approach and the use of shorter and flexible electrodes, the risk of vertigo after CI is less than 10%. Furthermore, the risk of vertigo and vestibular function loss is less than 5%. However, we still didn´t find direct correlation of postoperative subjective vertigo and loss of vestibular function. Regarding the risk of falls, the mean preoperative risk was 51% and was thus already higher than in a normal healthy population (0%-40%). There was yet no significant difference in risks of falls directly after CI.

Conclusions: Postural control in cochlear implant candidates is already decreased before surgery compared to a healthy population. However, comparison of pre- and postoperative body sway measurements did not reveal a significant increase in risk of falls. With new electrodes and better pre-and perioperative management, the development of vertigo after CI can be reduced. A good preoperative vestibular evaluation and patient’s information about the risk are still needed. Further testing with a larger study population would be necessary to determine the development of risk of falls over time after cochlear implant surgery. Furthermore, the influence of hearing rehabilitation with activated cochlear implant on the risk of falls should be considered.