The use of APHAB in ENT-faculty practices (Abbreviated Profile of Hearing Aid Benefit, HARL, German version) as an instrument for quality control in hearing aid fitting

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Background
For advanced quality control in hearing aid fitting there exist a lot of different German self-report questionnaires, but, unfortunately, none of them has been evaluated or validated by a large number of patients. The APHAB is a well-investigated one in the US and available in German language by the Hearing Aid Research Laboratory in Memphis, Tennessee, USA [1].

We have used the APHAB for comparison of the quality outcome between the Norm Table for WDRC-hearing aids [2] as the "gold standard" of hearing aid fitting by academically educated US-audiologists at one side and our German-APHAB research at the other side on patients fitted by the "shorted way - Verkürzter Versorgungsweg". Furthermore, we tried a wider outlook how to use the APHAB as an early indicator for better hearing aid fitting.

Methods
We have collected the German-APHAB data of 224 patients in nine German ENT-practices around Hamburg. The APHAB score has been measured before and after WDRC hearing aid fitting. The range of age has been from 9 up to 98 years, the gender has distributed in 90 male, and 134 female persons. The median age has been 72 years, the mean age 71 years, with a standard deviation of 13 years. All cases have answered four questions and more in every subscale, 186 cases have completed all 18 unaided and aided EC, RV, BN questions, 217 cases have completed all 6 unaided and aided AV questions. Data splitting at median age due to 108 cases ≤ 72 years and 116 cases ≥ 72 years.

We have compared APHAB mean score for EC-, RV-, BN-, and AV-subscale and have done a wider outlook by Fisher’s exact test and binominal test for each subscale.

Results
No severe differences in the distribution plots (as fig. 1), the normalized distribution (fig. 2), and 95% ellipse (as fig. 3) occur, all figures are examples for all APHAB-subscapes EC, BN, RV, and AV.

With the results of the Wilcoxon rank sum test we have investigated the important hypothesis "are the distributions of the percentiles from HARL and Hamburg statistical equal?". With a p < 0.025 we can clearly say: Yes! If we use the more conservative sign-test, which respects the zero-benefit cases, we still get a probability for plus-benefit for EC, BN, and RV about 0.75 to 0.78 and for AV = 0.28.

Conclusions
Yes we can use the German-APHAB for quality control in hearing aid fitting.
No severe quality differences between the academically educated US-Audiologists and German ENT-specialists by the "shorted way - Verkürzter Versorgungsweg" occur.
APHAB and sign-test mark a single case with the parameters mean score and probability. We can do better investigation using the APHAB by using the sign-test. We will continue to use the APHAB forms, analyse the scoring as soon as possible and use this information for doing technical adjustments to the hearing systems and the coaching for the negative hearing aid users and their families.
In the future, with a greater number of patients, we would be able to calculate the conditional probability for each couple of answered questions, so we could predict the kind of fitting progress of a patient after reporting the unaided APHAB. By this, it would be possible to find out difficult cases in the beginning.

References