Tinnitus can be a debilitating condition but little is known why some suffer from tinnitus while others merely are aware of the tinnitus with little impact on their lives. Studies have shown that audiologic factors such as amount of hearing loss or tinnitus characteristics do not offer an explanation. One possible explanation is that patients may perceive their tinnitus differently. There is a great deal of evidence in the psychological literature to suggest that perception and objective reality often are disconcertant. This data review, based on programmed Serenade devices, aimed to use a semi-objective method developed at SoundCure and integrated into the Serenade software to assess this perceptual difference that we’ll refer to as hypermonitoring. Patients rated the loudness of their tinnitus as quieter than the equivalent sound is an indication of hypermonitoring. This data may prove to be a valuable tool in determining treatment suitability, counseling patients on the process of habituation or potentially the mechanism of treatment, but long term controlled studies are needed. The next steps are to collect a control set of patients who experience tinnitus but are not bothered by it or seek treatment for it.

The average Subjective Tinnitus level is 5.8 +/-2.3. The average Ranking of the Matched Loudness is 1.9 +/-1.7. This indicates that the normal patients are hypermonitoring by 3.9 +/-2.6 points.

Figure 1 shows a scatter plot of the Subjective Loudness vs. the Ranking of the Matched Loudness. The solid diagonal represents values that would exist if a patient ranked their tinnitus the same as they rank the sound they match to their tinnitus. Dashed lines represent a subject error tolerance of +/- 3 dBSL, assuming a normal degree of loudness growth. This data review, based on programmed Serenade devices, aims to use a patient’s self assessment of their tinnitus loudness match as a comparison to their self assessed tinnitus loudness. Patients reporting their tinnitus as louder than the ranking of their tinnitus match can be said to be hypermonitoring. Hypermonitoring will be used to describe a subconscious process of the erroneous perception of tinnitus as louder than it should otherwise be soft, and not an attentional problem.

The ranking of the Tinnitus Match can now be compared to the Subjective Match.

METHODS AND MATERIALS

119 patients were evaluated using the SoundCure Serenade Tinnitus Treatment System. 3 patients were evaluated twice for a total of 122 data points. Patients were eligible if they had a programmed Serenade device from a SoundCure provider. The dataset was collected from 81 providers. Data were analyzed from the SoundCure programming database on which the Serenade software runs.

The Serenade software includes an optional test in which a provider can collect the ranked loudness of a patient’s tinnitus as a perception tool. The procedure is as follows:

1. A tinnitus pitch match is found using a loudness balanced slider.
2. A tinnitus loudness match is found at the pitch match using an adaptive procedure.
3. The patient’s subjective loudness is assessed using a 1-10 scale. This is asked about loudness and not severity.
4. The patient is asked to rank the loudness of their pitch match at a loudness levels presented 2 times each and averaged across the 2 presentations. The four loudness are Threshold, Tinnitus Match, 50% above match, and 50% above match.64 above match represents relative amount toward ULL.

The correlation is very poor (-0.065) indicating that dBSL is not a good indicator of whether a patient’s tinnitus is ‘soft’ or not.

Figure 3 shows a scatter plot comparing the patients loudness of their tinnitus match in dBSL vs. how loud they rank the match. The correlation is very poor (-0.065) indicating that dBSL is not a good indicator of whether a patient’s tinnitus is ‘soft’ or not.

Figure 4 shows a scatter plot comparing the patients loudness of their tinnitus match in dBLSL vs. how loud they rank the match. The correlation is very poor (-0.065) indicating that dBSL is not a good indicator of whether a patient’s tinnitus is ‘soft’ or not.

Figure 5 shows the distribution of patients across the loudness scale for each of the Subjective Rankings and the Matched Loudness Rankings. It can be seen there is a much greater distribution of the Subjective Rankings. 100 of the 122 (82%) Matched Rankings are 3 or less indicating a majority of tinnitus patients do have soft tinnitus.

CONCLUSIONS

- 85% of patients being fit with a SoundCure Serenade device perceive their tinnitus as louder than they should. This may indicate both the means through which patients habituate, or get better, and the recognition of an appropriate perception, and may be a useful tool for patient counseling and useful in assessing sound therapy, suitability. Future research is needed to verify both of these points.

REFERENCES

1. www.tinnitusarchive.org