Testing the Feasibility of Creating a Tinnitus Biobank
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Background
A feasibility study asks can something can be done? Should it be done?, and if so, How? Feasibility studies consider issues such as timing, participant burden, response rates, and testing logistics. We are investigating the feasibility of creating a tinnitus biobank to better understand what underlies tinnitus distress. The study addressed the following questions:

- Are people with tinnitus willing to provide data to a tinnitus biobank?
- What data should be collected and how?
- Do participants find the selected tests acceptable?
- How much time is needed to collect the desired data?
- Will participants attend an appointment in a laboratory and/or in a mobile testing unit located in a public space?

Methods
The research took place (a) in a laboratory at Manchester Centre for Audiology and Deafness (ManCAD) and (b) in a mobile testing unit (van) at location around Greater Manchester.

Laboratory-based testing
Participants (n=50)
- Tinnitus as reported on the tinnitus screener
- Mean age: 60. 1yr. (SD = 10.5), range: 41–79
- Normal hearing to profound hearing loss
- Recruited via ManCAD's research participant database, and social media

Test battery
Pre appointment
- Online questionnaires: Demographics, Tinnitus-specific case history, tinnitus severity, and sound sensitivity questionnaires
- In lab (testing was conducted for a max of 3 hr.)
  - Case history: Tinnitus and medical, measured height, weight, questionnaire based on the Noise Exposure Structured Interview
  - Hearing assessment: Otoscopy, tympanometry, PTA with extended high frequency testing (EHF), DPOAEs, Uncomfortable loudness levels, digits in noise test
  - Tinnitus severity questionnaires
  - Tinnitus percept: loudness and pitch matching, minimum masking level (MML), residual inhibition (RI)
  - Sound sensitivity questionnaires
  - Mental health and wellbeing questionnaires
  - Ratings of annoyance, boredom, fatigue, difficulty, and confidence during tests

Results
1. Willingness to take part
   >90% of participants attended their scheduled appointment, and >90% completed their pre-appointment questionnaires.

2. What data should be collected and how?
   Comparison of pre-appointment and lab-based questionnaire scores. Reported tinnitus was statistically more severe pre-appointment, but the differences are not clinically meaningful

We conclude questionnaires can be completed in advance of an in-person appointment.

Independence of questionnaire scores
Strongly correlated measures are assessing the same underlying construct. Intercorrelations between questionnaire scores here were:
- Tinnitus questionnaires: Range r=0.763 to r=0.914
- Sound sensitivity questionnaires: r=0.567 to r=0.574
- Mental health and wellbeing questionnaires: r=0.272 to r=0.391

We conclude some questionnaires can be omitted because they assess the same construct.

3. Test acceptability
   Figure 2 shows participants' acceptability ratings by measure type with ± 1 SD error bars.
   No tests had mean burden scores of >4; all had a mean confidence scores of >6.
   We conclude all measures were acceptable to participants.

4. Time needed for data collection
   Table 1 shows information about the time taken to complete each test measure.

Mobile unit (van) testing
Method (ongoing)
- Tinnitus UK pre-arranges a location for testing, typically a supermarket car park.
- Participants register for the study, select a test location and appointment time. They then receive a link to complete the pre-appointment questionnaires.
- During the van appointment participants complete a medical history, hearing assessment and tinnitus percept measures.

Preliminary results
10 of 12 weeks of van testing have been completed Appointments are taking about 1 hour to complete Tinnitus UK has managed to arrange a testing location everyday.
133 appointments have been scheduled, representing 64% of the 207 possible time slots (past and future).
73 appointments have been attended, there have been 12 no shows, 28 appointments were cancelled in advance by a participant and 8 appointments were cancelled by the research team. 16 of these cancelled appointments have been rebooked.

Summary
The data collected in the lab determined the battery used for mobile unit testing.
- Attendance at scheduled appointments has been acceptable indicating willingness to give data to a tinnitus biobank.
- The good agreement between pre-appointment and at-appointment questionnaire scores means questionnaires can be completed in advance, saving time during the appointment.
- No tests have been rated as burdensome
Tinnitus UK will use this data to decide on the next steps towards setting up a Tinnitus Biobank.

References

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