A multi-disciplined approach to tinnitus research

Nottingham Hearing Biomedical Research Unit
Kathryn Fackrell
NIHR Innovative approach

Intention
• Basic research
• Creation

Adoption
• Commissioning
• Uptake

Diffusion
• Patient care
• Spread

Evaluation
• Applied research
• Assessment

Nottingham Hearing Biomedical Research Unit
Research areas

Tinnitus etiology and management

Habilitation for hearing loss

Advanced imaging

Sensorineural plasticity and rehabilitation

Cochlear implantation

Paediatric ENT and Audiology

Large-scale studies of hearing and hearing health
Tinnitus etiology and management

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PhD students
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Jeff Davies
Lucy Handscomb
Kate Greenwell
Addressing questions

Evaluating interventions
- Benefit of self-help programmes
- Evaluation of the Acoustic CR® Neuromodulation device for tinnitus
- Efficacy of hearing aids for tinnitus
- Effectiveness of audiologist-delivered counselling
- Evaluating digital combination hearing aid programmes

Exploring therapeutic target
- Effect of tinnitus on working memory and attention
- Validation of a new cognitive model of tinnitus

Measuring tinnitus
- Functional connectivity in the tinnitus brain
- Validation of the Tinnitus Functional Index
Evaluating self-help programmes

- People want to take responsibility for their health

Self-help programmes:
  - aim to reduce tinnitus distress
  - offered outside of the medical consultation
  - provide some of the same (or complementary) benefits to traditional clinical intervention
Evaluating self-help programmes

There are several self-help programmes available for tinnitus

- Commissioning guidelines recommend using self-help programmes

HOWEVER

- Very little detail provided
- No high-level evidence on what works best and who gains most benefit

Evaluating online programmes - Make suggestions for improvements
What we are doing…

1. What intervention techniques are used within self-help interventions for adults with tinnitus?

2. Do self-help interventions effect people’s health and well-being?

Contact Kate Greenwell: msxkg1@nottingham.ac.uk
What we are doing...

Tinnitus E-Programme

www.tinnitusprogramme.org

Contact Kate Greenwell: msxkg1@nottingham.ac.uk
Addressing questions

Exploring therapeutic target

Effect of tinnitus on working memory and attention

Validation of a new cognitive model of tinnitus

TINNITUS

- Sleep
- Cognitive
- Quality of life
- Emotional
- Auditory
- Control
Effect of tinnitus on working memory and attention

“Why does mental activity (such as reading) make tinnitus worse?

James Lind Alliance Priority Setting Partnership

Clinical model of tinnitus

Tinnitus signal → No annoyance

Cognitive deficits

and/or

Emotional processing bias

Annoyance

Negative appraisal of tinnitus

Non-auditory brain regions and tinnitus

(Andersson & McKenna, 2006; Adjamian et al., 2009; de Ridder et al., 2011; Hall et al. 2013)
Our hypothesised model

- Fluid intelligence
- Psychological well-being
- Hearing Handicap
- Sustained Attention
- Working memory
- Attention switching
- Selective Attention

Tinnitus severity

Contact Najibah Mohamad: msxwnw@nottingham.ac.uk
A psychological model of tinnitus
A psychological model of tinnitus

Aims:
• Is it accurate? Multiple questionnaires to test all components of model and their interactions
• Is it useful? Ask patients and clinicians about the model

Why is this important?
• Which elements to focus on?
• Is the model useful as a counselling tool?

Contact Lucy Hanscomb: msxleha@nottingham.ac.uk
Addressing questions

TINNITUS

Sleep

Cognitive

Quality of life

Emotional

Auditory

Measuring tinnitus

Functional connectivity in the tinnitus brain

Validation of the Tinnitus Functional Index
The importance of questionnaires

A diagnostic tool

✓ Crucial to client-centred and evidence-based practice
  • To determine treatment candidacy with equal patient access to treatments
  • To provide patient feedback

An outcome measure

✓ Demonstrates clinical effectiveness
  • To facilitate clinical audit - inform commissioners
✓ Evidence of improvements
  • Justifies resource allocation
  • To ascertain key standards of best practice for tinnitus
How do we know whether a treatment works?

Measuring score (e.g. questionnaire asking about severity of tinnitus-related symptoms)

Before treatment (baseline)  After treatment (follow-up)
Validating a new tinnitus questionnaire: Tinnitus Functional Index (TFI)

Does the questionnaire reflect what it is measuring?

Does the questionnaire compare to others tinnitus questionnaires?

Does the questionnaire reliably show changes that occur over time?

Is there a grading system?

Diagnostic tool & measure of change of tinnitus distress
What do we know so far…

TFI compared to Tinnitus Handicap Inventory

Tinnitus Functional Index

- Sleep: 36%
- Auditory perception: 16%
- Health: 12%
- Impact on lifestyle: 12%
- Psychological/emotional: 12%
- Tinnitus-specific: 12%
UK clinical population

250 new tinnitus patients

- T0: Baseline
  - appointment

- T1: 3 months
  - via post

- T2: 6 months
  - via post

- T3: 9 months
  - via post
Thank you for listening

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