NIHR Nottingham Hearing
Biomedical Research Unit

The relationship between tinnitus, neuroticism and measures of mental health in a large UK population aged 40 to 69 years

Abby McCormack, Mark Edmondson-Jones, Heather Fortnum, Piers Dawes, Hugh Middleton, Kevin Munro, Dave Moore
Background

- Tinnitus affects approximately 17% of the UK population (Dawes et al., submitted).
- Not everyone with tinnitus will experience the same amount of distress
  - Personality characteristics may mediate the impact of tinnitus
- Evidence that neurotic traits may be stronger in tinnitus patients (Holgers et al., 2005).
- It is thought that the perceived severity of tinnitus is more closely correlated with psychological factors than with audiometric measures
- Strong association with depressive and anxiety disorders
Aim

- To examine the link between tinnitus and a predisposing personality factor, neuroticism

- To examine the association between tinnitus and symptoms of depression and anxiety, while controlling for neuroticism.
Tinnitus and neuroticism

Aim: Examine the link between tinnitus and a predisposing personality factor, neuroticism

<table>
<thead>
<tr>
<th>Description</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood swings</td>
<td>Does your mood often go up and down?</td>
</tr>
<tr>
<td>Miserableness</td>
<td>Do you ever feel 'just miserable' for no reason?</td>
</tr>
<tr>
<td>Irritability</td>
<td>Are you an irritable person?</td>
</tr>
<tr>
<td>Sensitivity/hurt feelings</td>
<td>Are your feelings easily hurt?</td>
</tr>
<tr>
<td>Fed-up feelings</td>
<td>Do you often feel 'fed-up'?</td>
</tr>
<tr>
<td>Nervous feelings</td>
<td>Would you call yourself a nervous person?</td>
</tr>
<tr>
<td>Worrier/anxious feelings</td>
<td>Are you a worrier?</td>
</tr>
<tr>
<td>Tense/highly strung</td>
<td>Would you call yourself tense or 'highly strung'?</td>
</tr>
<tr>
<td>Worry too long after embarrassment</td>
<td>Do you worry too long after an embarrassing experience?</td>
</tr>
<tr>
<td>Suffer from nerves</td>
<td>Do you suffer from 'nerves'?</td>
</tr>
<tr>
<td>Loneliness/isolation</td>
<td>Do you often feel lonely?</td>
</tr>
<tr>
<td>Guilty feelings</td>
<td>Are you often troubled by feelings of guilt?</td>
</tr>
<tr>
<td>Risk taking</td>
<td>Would you describe yourself as someone who takes risks?</td>
</tr>
</tbody>
</table>
Tinnitus and neuroticism

A logistic regression was performed of the likelihood of reporting current tinnitus (included in model, N=155,487) and bothersome tinnitus (included in model, N=44,045)

Results
Those that scored high on neuroticism were more likely to report tinnitus (OR=2.11, 95% CI=2-2.2)

Those that scored high on neuroticism were more likely to report bothersome tinnitus (OR=4.11, 95% CI=3.7-4.6)

Neuroticism has a stronger effect on the perceived severity of tinnitus than hearing difficulty
Tinnitus and mental health

- Depressed mood
- Tiredness/lethargy
- Unenthusiasm/disinterest
- Tenseness/restlessness
- Guilty feelings
- Sleeplessness/insomnia

Anxiety questions
- Worrier/anxious
- Irritability
- Sleeplessness/insomnia
- Tiredness/lethargy
- Tenseness/restlessness

Hypothesis = those reporting tinnitus, particularly bothersome tinnitus, will be more likely to report greater symptoms of anxiety and depression independently of neuroticism.

UK Biobank questions limited – no clinical diagnosis of depression or anxiety
Tinnitus and mental health

Generalised linear modelling of reporting depressive symptoms and anxiety symptoms

Results

• As predicted neuroticism and depression (OR=10.39, 95% CI=10.15-10.63) and anxiety (OR=8.76, 95% CI=8.59-8.93) were strongly associated.

While controlling for neuroticism and hearing difficulty:

• Those with bothersome tinnitus were more likely to report depressive symptoms (OR=1.15, 95% CI=1.12-1.18) and anxiety symptoms (OR=1.05, 95% CI=1.02-1.07) than those without tinnitus.
Discussion

• First population study to show that personality factors are associated with tinnitus

• Neuroticism has a stronger effect on the perceived severity of tinnitus than hearing difficulty

• Study supports an interpretation that otherwise stable personality factors and mood influence the ways in which tinnitus is experienced.

• After controlling for neuroticism, tinnitus patients were still more likely to report depression and anxiety symptoms.
Implications for future research and clinical practice

- Psychological interventions may be beneficial for tinnitus patients over the long-term.

- Treatments can be tailored to personality types.

- Tinnitus severity = complex interaction involving auditory, psychological and emotional networks.

- Treatment for depression and anxiety.
Thank you

abby.mccormack@nottingham.ac.uk