Prevalence and treatment of co-morbid anxiety and depression among 352 dizzy patients: A retrospective study

1 | INTRODUCTION

Dizziness is the description of a constellation of various symptoms that can create limitations in patients’ lives, often leading to psychological stress. The connection between mental distress, such as anxiety and depression, and dizziness disorders is increasingly better appreciated. Recent studies have shown that co-morbid psychological disorders alongside a patient’s dizziness may: (a) contribute to the overall symptom burden in dizzy patients, (b) worsen their quality of life and (c) have a detrimental effect on dizziness treatment outcomes.1-4

Conversely, psychological states such as anxiety may themselves lead to feelings of dizziness. A number of past studies have investigated psychologically-induced dizziness, where dizzy symptoms are thought to be a consequence of psychiatric illness, and terms such as “phobic postural vertigo”, “chronic subjective dizziness” and “persistent postural perceptual dizziness” have arisen in the literature.5

At our institution, we use the Hospital Anxiety and Depression Scale (HADS)6 to assess for possible anxiety or depression in our patients. The HADS has been validated against formal psychiatric assessment in many languages and settings7 and is useful as a case finder in the initial diagnosis of anxiety and/or depression. However, the association between different aetiologies of dizziness and their psychological burden remains unclear. Likewise, existing literature on the availability of treatment for co-morbid anxiety and/or depression in dizzy patients is limited. This report describes our institution’s experience of these topics.

Our aims were:

- To determine the prevalence of co-morbid anxiety and depression in a large, unselected sample of dizzy patients at a tertiary centre in the United Kingdom
- To assess how the degree of anxiety and depression varies between different aetiologies of dizziness
- To evaluate our institution’s current process for managing psychological co-morbidities

2 | METHODS

2.1 | Ethical considerations

This study was registered with our institution’s Clinical Audit department. Patient information was anonymised prior to data analysis.

2.2 | Patient selection

In our clinic, patients referred from primary care with complaints of dizziness will typically first see an Otolaryngology consultant. Suitable patients are then referred for vestibular assessment, where they undergo a series of vestibular tests and complete the Hospital Anxiety and Depression Scale (HADS), with follow-up Otolaryngology consultation several weeks later for more definitive diagnosis.

Records were retrospectively obtained for 391 patients who underwent vestibular assessment between 1 January 2017 and 31 December 2017. The diagnosis documented at first follow-up consultation after vestibular assessment was recorded for each patient with a completed HADS questionnaire. For 56 patients who had no follow-up consultation, the provisional diagnosis made prior to or at vestibular assessment was taken as the diagnosis.

2.3 | Diagnostic categories

Diagnoses were grouped as follows: “Unilateral/Bilateral peripheral hypofunction” (UPH/BPH), “Benign paroxysmal positional vertigo” (BPPV), “Cardiovascular”, “Cerebellopontine angle (CPA) tumour”, “Labyrinthitis”, “Ménière’s disease”, “Vestibular migraine”, “Multifactorial cause”, “Neurological”, “Vestibular neuritis”, “Other”, “Psychogenic dizziness”, “Multiple diagnoses” and “No established diagnosis”. “Psychogenic dizziness” includes diagnoses of Anxiety-related dizziness and Hyperventilation syndrome. Diagnoses in the “Other” category include Eustachian tube dysfunction, otosclerosis and trauma-related causes,
among others. Patients for whom no diagnosis was given at either initial or follow-up consultation were classed as “No established diagnosis”.

For twenty-five patients, multiple diagnoses of dizziness were documented. These included: Vestibular migraine and Psychogenic dizziness (6 patients), BPPV and Ménière’s (2 patients), BPPV and Vestibular migraine (2 patients), BPPV and Psychogenic dizziness (2 patient), BPPV and CPA tumour (2 patients), BPPV and Vestibular neuritis (1 patient), BPH and BPPV and Psychogenic dizziness (1 patient), Ménière’s and Vestibular migraine (1 patient), Neurological and Psychogenic dizziness (2 patients), BPH and Ménière’s (1 patient), BPH and Vestibular migraine (1 patient), Neurological and Vestibular neuritis (1 patient), CPA tumour and Psychogenic dizziness (1 patient), and Other and Psychogenic dizziness (1 patient).

### 2.4 Psychological assessment

The Hospital Anxiety and Depression Scale (HADS) is a widely used tool validated for assessing anxiety and depression. It consists of 14 items, an anxiety subscale and a depression subscale. Each contains seven items ranked 0-3 according to frequency of incidence. For both scales, scores of <7 indicate non-cases, 8-10 mild cases, 11-14 moderate cases and 15-21 severe cases. We considered scores ≥11 to be positive, signifying moderate-to-severe anxiety/depression.

### 2.5 Statistical analysis

We used R and RStudio (2018) to perform statistical analysis. Mann-Whitney U and Kruskal-Wallis tests were used for analysis of continuous variables. P < .05 was considered statistically significant.

### 3 RESULTS

#### 3.1 Patient characteristics

Ninety per cent (352/391) of patients seen at vestibular assessment completed the HADS questionnaire. Of these, 127 (36%) were men and 225 (64%) were women. The median age was 56 and the age range was 10-88 (distribution in Figure 1), with no significant difference in the mean age by sex (Mann-Whitney U test, P = .79).

The number of patients diagnosed for each category is shown in Table 1, given in order of prevalence. There was a significant difference between the mean ages of patients with different diagnoses who were assessed in our clinic (Kruskal-Wallis rank sum test, P < .001). On average, patients with BPPV were the oldest (mean age = 65), while patients with psychogenic dizziness (mean age = 48), vestibular migraine (mean age = 47) and diagnoses falling under the “Other” category (mean age = 44) were the youngest.

#### 3.2 Psychological assessment

The mean HADS Anxiety score was 8.2 (SD 4.7) and the mean HADS Depression score was 5.8 (SD 4.5). Women (mean = 8.7) had significantly greater HADS Anxiety scores than men (mean = 7.3) (Mann-Whitney U test, P = .010). In contrast, there was no significant difference in HADS Depression scores between men (mean = 5.8) and women (mean = 5.8) (Mann-Whitney U Test, P = .82).

The mean HADS Anxiety and Depression scores for each diagnostic category are shown in Table 1. There was a significant difference in mean HADS Anxiety score (Kruskal-Wallis rank sum test, P = .002), but not HADS Depression score (P = .46) between diagnostic categories. A significant correlation was found between HADS Anxiety and Depression (Spearman Rank Correlation co-efficient, ρ = 0.597, P < .001) score. The distribution of relative burden of anxiety and depression among different aetiologies of dizziness is shown in Figure 2.

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**Key Points**

- Patients with dizziness report high levels of anxiety and depression, which may be unrecognised.
- Levels of anxiety, but not depression, vary among different aetiologies of dizziness.
- Dizzy patients with anxiety and/or depression are not receiving appropriate referral for treatment of these co-morbidities.
- Future studies are required to assess referral pathways for psychological co-morbidity at other centres.
Treatment of patients with moderate-to-severe (HADS ≥ 11) anxiety and depression

Secondary analysis was performed to determine the proportion of patients classified as having "moderate-to-severe" anxiety or depression, defined as HADS Anxiety or Depression score ≥ 11. Thirty per cent (106/352) and sixteen per cent (56/352) of patients had respective HADS Anxiety or Depression scores ≥11 (Table 2).

Records of the 106 patients with "moderate-to-severe anxiety" and 56 patients with "moderate-to-severe depression" were
subsequently checked to determine whether any action was recommended based on their clinically significant HADS scores. Only 12/106 (11.3%) and 9/56 (16.1%) patients with moderate-to-severe anxiety or depression respectively were referred to their GP for follow-up psychological evaluation.

4 | DISCUSSION

4.1 | Summary of key findings

We conducted a study examining the prevalence of anxiety and depression among different causes of dizziness at our tertiary centre. Overall, thirty and sixteen per cent of patients were found to have moderate-to-severe anxiety or depression respectively. This represents a substantially greater psychological burden compared to the general population, where 12.6% and 3.6% are reported to have moderate-to-severe anxiety or depression.8

Among the different diagnostic categories, a high percentage of patients diagnosed with either multiple aetiologies of dizziness, psychogenic dizziness or Ménière’s disease had moderate-to-severe anxiety. Overall, our data show a similar trend to previous studies that have found higher levels of anxiety in patients with Ménière’s disease and vestibular migraine compared to vestibular neuritis and BPPV.2,9 In contrast, there was no significant difference in depression scores between diagnostic categories.

Notably, although 90% of patients completed the HADS questionnaire, less than 15% of patients with high HADS scores were referred to their GP for full psychiatric evaluation. We were unable to find previous studies reporting psychological referral rates at a tertiary dizziness centre for patients with suspected anxiety or depression, but our data suggest that dizzy patients with anxiety or depression are not receiving appropriate treatment for these co-morbidities. Future studies are required to further assess referral pathways for suspected psychological co-morbidity at other dizziness centres.

4.2 | Limitations and strengths

We used the Hospital Anxiety and Depression Scale to evaluate the prevalence of anxiety and depression, with a cut-off score of ≥11 indicating moderate-to-severe illness. The HADS represents a time-efficient case-finding tool for diagnosing anxiety/depression in a clinical setting and has a high reported sensitivity and specificity.10 However, it uses a dimensional diagnostic approach that is less robust than formal structured psychiatric interview.

The retrospective nature of this study and lack of pre-defined diagnostic categories provides insight into the identification and management of co-morbid anxiety and depression in a real-world clinical setting. Our large sample of patients increases the applicability of our findings to other institutions, both in the United Kingdom and worldwide.

5 | CONCLUSION

This is one of few studies reporting the psychological burden of different dizziness aetiologies, and the first at a neurotology centre in the United Kingdom. We believe that greater clinician awareness and focus on treating co-morbid psychological sequelae is required to improve the care of the dizzy patient.

CONFLICTS OF INTEREST
The authors state no conflicts of interest.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on reasonable request from the authors. The data are not publicly available due to privacy or ethical restrictions.

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