

TINNITUS TREATMENT AND USE OF BENZODIAZEPINES

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SUMMARY

Background: In Europe, 14.7% of the population suffer from chronic tinnitus. Regarding pharmacological treatment of tinnitus, there is currently no evidence-based protocol recommendation. Tinnitus Retraining Therapy is the only effective method available in specialized multidisciplinary centers.

Subject and method: By analyzing 116 patients who underwent rehabilitation in a multidisciplinary audiophonology center, we quantified the use of benzodiazepines before and after treatment.

Results: Among patients suffering from chronic tinnitus, there is an over-prescription of benzodiazepines, which can be reduced through proper care.

Conclusion: Better awareness among frontline healthcare professionals about treatment in specialized multidisciplinary centers should be reinforced in order to enable quicker referrals and avoid therapeutic wandering or inappropriate use of benzodiazepines.

Key words: Tinnitus – benzodiazepines - treatment

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INTRODUCTION

Tinnitus is defined as a sound perceived in the ear without any corresponding external stimulus. Tinnitus is clinically heterogeneous in its etiology, perceptual characteristics, and associated symptoms. Therefore, treatment responses vary greatly (Langguth et al. 2013). This condition is highly prevalent. A recent 2022 study (Biswas et al. 2022) estimated the prevalence of tinnitus in Europe at 14.7%. This prevalence increases significantly with age and hearing loss.

Regarding treatment, after medical examinations performed by an ENT specialist, a treatable condition associated with tinnitus may be discovered, which sometimes requires specific treatment. However, the condition is not always treatable (Baguley et al. 2013). The heterogeneity of tinnitus complicates treatment. There is no uniformly effective treatment for these patients.

Lidocaine and other drugs mimicking its effects on the central nervous system such as tocainide, flecainide, mexiletine, and carbamazepine have not been proven effective against tinnitus (Elgoyhen & Langguth 2010). The use of local corticosteroids (intratympanic) may be better than placebos, but there is no tangible evidence of effectiveness in treating tinnitus (Kleinjung & Langguth, 2021). Zinc supplementation could be helpful. Several studies (Arda et al. 2003; Ochi et al. 2003; Paaske et al. 1991; Yetiser et al. 2002) show contradictory results, and no conclusion can be drawn on the effectiveness of zinc in tinnitus treatment.

There is also insufficient evidence regarding the effectiveness of antidepressants in treating tinnitus (Kleinjung & Langguth 2021).

Studies on carbamazepine, gabapentin, and lamotrigine have failed to show beneficial effects in the context of tinnitus (Kleinjung & Langguth 2021). Nevertheless, carbamazepine and other anticonvulsants such as oxcarbazepine, gabapentin, lamotrigine, and pregabalin may be useful when tinnitus has a neurovascular origin (Elgoyhen & Langguth 2010).

Many physicians recommend antidepressants, anti-epileptics, anxiolytics, or intratympanic medications to treat persistent and bothersome tinnitus. In the literature, no systematic medication recommendation is advised for tinnitus as no relief has been demonstrated. No drug has been approved by the Food and Drug Administration (FDA) for the treatment of tinnitus to date (Dalrymple et al. 2021).

Tinnitus can lead to anxiety symptoms and is associated with a reduction in inhibitory neurotransmission in the auditory pathways. Anxiolytics such as benzodiazepines are often used to help patients. Once again, clinical results are mixed (Kleinjung & Langguth 2021).

Our research focused on evaluating the use of benzodiazepines in patients treated in a specialized audiophonology center for tinnitus.

SUBJECT AND METHOD

The objective of this research is to quantify benzodiazepine use in patients with chronic and debilitating tinnitus arriving at the audiophonology center of CHU UCL NAMUR, Godinne site. All patients who received a multidisciplinary assessment at the audiophonology center of CHU UCL Namur, Godinne site, between 2010 and 2020 were included in the study. Documented data include: age, sex, presence of prior

Table 1. Patient's characteristics for who a multidisciplinary assessment was made (N=166)

Characteristics	All patients (N=166)	Complete rehabilitation (N=116)	Uncomplete rehabilitation (N=50)
Age – years			
Average ± standard deviation	51±13	51±12	53±12
Median (min-max)	53 (16-77)	52 (18-77)	54 (16-69)
Man – n (%)	108 (65)	73 (63)	35 (70)
ORL diagnoses associated with tinnitus – n (%)	69 (42)	49 (42)	20 (40)
Psychiatric diagnoses – n (%):			
0	25 (15)	19 (16)	6 (12)
1	74 (45)	56 (48)	18 (36)
2	55 (33)	33 (28)	22 (44)
3	10 (6)	7 (6)	3 (6)
4	2 (1)	1 (1)	1 (2)
Previous Psychiatric diagnoses – n (%):			
0	113 (68)	82 (71)	31 (62)
1	51 (31)	33 (28)	18 (36)
2	2 (1)	1 (1)	1 (2)
Previous psychologic/psychiatric follow-up – n (%):			
Psychologic follow-up	34 (20)	20 (17)	14 (28)
Psychiatric follow-up	11 (7)	9 (8)	2 (4)
Psychologic and psychiatric follow-up	2 (1)	1 (1)	1 (2)

psychological or psychiatric treatment, ENT diagnosis, previous and current medication, as well as prior and post psychiatric diagnoses according to the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders IV). Only the 116 patients who completed full rehabilitation were considered.

All data were collected from medical records using OMNIPRO® software (version 4.6.9a) and entered in EXCEL® (version 2303). The data were analyzed using STATA® software (version 17.0). Approval was granted by the ethics committee of CHU UCL NAMUR Godinne (66/2023). Data collection complied with the General Data Protection Regulation (GDPR).

RESULTS

Descriptive analysis

General population characteristics are presented in Table 1.

Between 2010 and 2020, 166 patients underwent a multidisciplinary assessment at the audiophonology center (CAP) of CHU UCL Namur, Godinne site. Among them, 70% (116 patients) completed full rehabilitation following the assessment, while 30% (50 patients) either did not begin or prematurely ended rehabilitation.

Benzodiazepine use

Regarding psychotropic use, the data collected refer to medications taken when patients arrived at the audiophonology center for assessment.

Overall, 67 patients (40%) were taking no medication, and 101 patients (60%) were taking at least one psychotropic drug.

As shown in Table 2, 26% of patients were taking antidepressants, 48% were taking benzodiazepines, and 4% were taking neuroleptics. Some patients were taking up to three different medications within the same class (benzodiazepines, antidepressants, or neuroleptics). During treatment, a different medication regimen was introduced. To analyze the medications prescribed during treatment, only patients who completed rehabilitation (n=116, 70% of the total sample) were considered.

Table 2. Psychoactive drugs by patients for who a multidisciplinary assessment was made

Psychoactive drugs	N=166
No psychoactive drugs – n (%):	67 (40)
Psychoactive drugs – n (%):	99 (60)
Benzodiazépine(s)	80 (48)
1 benzodiazépine	69 (42)
2 benzodiazépines	7 (4)
3 benzodiazépines	4 (2)
Antidpressant(s)	43 (26)
1 antidépressant	35 (21)
2 antidépressants	7 (4)
3 antidépressants	1 (1)
Antipsychotic(s)	7 (4)
1 antipsychotic	6 (4)
2 antipsychotics	1 (1)

Benzodiazepines and alcohol

Among the 10 patients suffering from alcohol dependence, 6 (60%) were taking a benzodiazepine, and 4 (40%) were not.

Benzodiazepines, sleep disorders, and anxiety disorders

Benzodiazepines are generally prescribed for sleep and anxiety disorders. Among patients using benzodiazepines, 38% had sleep disorders, 23% had anxiety disorders, and 7% had both.

Among patients with sleep disorders, 55% were using benzodiazepines. Among those with anxiety disorders, 58% were using benzodiazepines.

Proportion comparison test of psychotropic use before and during treatment

To examine whether there was a difference in benzodiazepine use between before and during treatment among patients who completed full rehabilitation, we used a McNemar test (Table 3).

Table 3. Contingency's table of benzodiazepine's use before and after treatment

	Avant	Durant	
Benzodiazepines +	49	1	50
Benzodiazepines -	67	115	182
	116	116	232

There were 49 out of 116 patients (42%) using benzodiazepines before treatment compared to 1 patient (1%) during treatment. The McNemar test showed a statistically significant difference between benzodiazepine use before and during treatment, $\chi^2 (1, N = 116) = 46.08, p\text{-value} < 0.01$.

There is a significant reduction in benzodiazepine use over time.

DISCUSSION

We observed that 48% of patients were using benzodiazepines and 26% were using antidepressants. Psychotropic use appears to be higher among patients with chronic and debilitating tinnitus than in the general population.

Benzodiazepine prescriptions should be symptomatic and short-term (maximum 3 weeks), and systematically combined with educational and psychological support. In our population, benzodiazepine use was found in 48% of patients. Anxiety and sleep disorders are the most common reasons for benzodiazepine prescription. Among benzodiazepine users, 38% had sleep disorders, 23% had anxiety disorders, and 7% had both.

Given that a large proportion of patients had no prior formal diagnosis, it is possible that some prescriptions

(68%) were related to anxiety or sleep complaints without a proper diagnosis. For those without such disorders, prescriptions might be related solely to tinnitus (or depressive symptoms).

Anxiolytics should be prescribed as part of a comprehensive treatment plan including information and psychological support. However, 71% of CAP patients using benzodiazepines had no prior psychological or psychiatric follow-up.

A study by Panes et al. (2020) estimated non-recommended benzodiazepine use between 44.9% and 68.1%, with increased risk among psychiatric patients. Patients with psychiatric disorders are particularly vulnerable to benzodiazepine use.

As shown in our study and others, psychiatric disorders are more prevalent in patients with chronic debilitating tinnitus than in the general population. Some patients arrive at the audiophonology center already on inappropriate benzodiazepine regimens, sometimes for months or even years.

Alcohol use is contraindicated with benzodiazepines. However, benzodiazepines can be helpful in supervised withdrawal. Among the 10 patients with alcohol dependence in our population, 6 were using benzodiazepines.

People with substance use disorders have higher rates of benzodiazepine misuse than the general population. Alcohol use and related disorders increase the risk of benzodiazepine misuse and contribute to overdose risk (Votaw et al. 2019).

Among all patients who completed full rehabilitation, 42% were using benzodiazepines upon arrival at the CAP. During treatment, only 1% were using them.

To assess the difference in benzodiazepine use before and during treatment, we used a McNemar test. The test revealed a significant decrease in benzodiazepine use. The treatment process significantly reduced benzodiazepine use.

Most patients experienced significant improvement in their tinnitus symptoms without using benzodiazepines, as reflected in improved TQ scores. This supports the notion that benzodiazepines are not effective for these patients.

CONCLUSION

Our results show an excessive and inadequate prescription of benzodiazepines among patients suffering from tinnitus. Participation in a multidisciplinary treatment center appears to facilitate benzodiazepine deprescription.

Lack of knowledge about tinnitus and its treatments seems to lead to off-guideline medication use. Benzodiazepine and antidepressant use is a real concern in patients with chronic and debilitating tinnitus.

It is important to increase general knowledge of tinnitus and its management among the public, general practitioners, and specialists. This would enable faster referral of tinnitus patients to appropriate multidisciplinary centers. Earlier intervention could help avoid inappropriate medication and worsening of tinnitus and psychiatric symptoms. Furthermore, broader awareness may encourage the development of multidisciplinary care offerings.

Recommendations for tinnitus management and associated psychotropic use should be developed to help guide physicians.

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Philippine Martin: interpretation of the data and drafting the manuscript.

Thomas Dubois: collect of the data.

Denis Jacques: idea of the article, collect and interpretation of the data and drafting the manuscript.

All authors approved the final manuscript.

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