

# Medical Treatment Approaches in Vestibular Disorders: A Descriptive Cross-Sectional Study

## Vestibüler Sistem Bozukluklarında Medikal Tedavi Yaklaşımları: Tanımlayıcı Kesitsel Bir Çalışma

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**ABSTRACT Objective:** Medical management of vestibular disorders is challenging and requires deep knowledge of clinical pharmacology. The present study aimed to research the medical approaches to vertigo by ear-nose and throat specialists in Türkiye. **Material and Methods:** A 15-item web-based survey assessing medical treatment of vertigo was devised by researchers and distributed to ear-nose and throat specialists via the internet. Questions were composed of multiple-choice answers, except for the drug related question. The questions were divided into 4 groups: demographic questions, questions about vertigo patients, medical treatment approaches and benign paroxysmal positional vertigo. **Results:** A total of 154 participants were included in the study. Major findings are that most of the participants could not spare enough time for patients with vestibular disorders and did not have access to the vestibular laboratory. Betahistine was one of the most used drugs in the medical treatment of vertigo. **Conclusion:** In the medical treatment of vestibular disorders, clinical and laboratory tests and interdisciplinary work are crucial, as well as pharmacological knowledge. Clinicians should use a personalized approach to pharmacotherapy when treating patients, avoiding the use of unnecessary medications, and considering the patient's comfort, long-term recovery, side effects, and interactions with other treatment modalities like surgery and vestibular rehabilitation.

**ÖZET Amaç:** Vestibüler bozuklukların tıbbi yönetimi zordur ve derin klinik farmakoloji bilgisi gerektirir. Bu çalışma, Türkiye'deki kulak burun boğaz uzmanlarının vertigoya tıbbi yaklaşımlarını araştırmayı amaçlamıştır. **Gereç ve Yöntemler:** Araştırmacılar tarafından vertigonun tıbbi tedavisini değerlendiren 15 maddelik web tabanlı bir anket hazırlandı ve internet aracılığıyla kulak burun boğaz uzmanlarına dağıtıldı. İlaçlar ile ilgili soru dışında sorular çoktan seçmeli cevaplardan oluşturulmuştur. Sorular demografik sorular, vertigo hastalarına yönelik sorular, medikal tedavi yaklaşımları ve benign paroksizmal pozisyonel vertigo olmak üzere 4 gruba ayrılmıştır. **Bulgular:** Çalışmaya toplam 154 katılımcı dâhil edildi. Başlıca bulgular, katılımcıların çoğunun vestibüler bozukluğu olan hastalara yeterince zaman ayıramaları ve vestibüler laboratuvara erişimlerinin olmamasıdır. Betahistin, baş dönmesinin tıbbi tedavisinde en çok kullanılan ilaçlardan biriydi. **Sonuç:** Vestibüler bozuklukların medikal tedavisinde farmakolojik bilginin yanı sıra klinik ve laboratuvar testleri ile disiplinler arası çalışma çok önemlidir. Klinisyenler hastaları tedavi ederken, gereksiz ilaç kullanımından kaçınarak hastanın rahatını, uzun vadeli iyileşmeyi, yan etkileri, cerrahi ve vestibüler rehabilitasyon gibi diğer tedavi yöntemleriyle etkileşimlerini dikkate alarak kişiselleştirilmiş bir farmakoterapi yaklaşımı kullanmalıdır.

**Keywords:** Benign paroxysmal positional vertigo; drugs; medical treatment; vestibular diseases

**Anahtar Kelimeler:** Benign paroksizmal pozisyonel vertigo; ilaç; medikal tedavi; vestibüler hastalıklar

Vertigo is one of the most common cause of visits to emergency, ear nose throat (ENT), and neurology clinics.<sup>1,2</sup> Due to its complex etiology, diagnosis and treatment/rehabilitation are often challenging. Bedside examination, laboratory tests, and vestibular tests are used for diagnosis based on prognosis and anamnesis.<sup>3-6</sup> However, since not all evaluations are

required for each patient or the same facilities are not available in all clinics, these evaluations can be performed in different combinations.

Depending on the underlying cause, pharmacological treatment, vestibular rehabilitation, psychotherapeutic approaches, and rarely surgery are used in the treatment. Since both vertigo and accom-

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panying symptoms (nausea, vomiting, tinnitus, etc.) exhaust the patient, especially in the acute period, the first approach is usually to try to relieve symptoms as soon as possible. Pharmacological treatment is one of the most commonly used methods to relieve the symptoms. Following or simultaneously with symptomatic treatment, the appropriate approach to the nature of the disease is selected (e.g. vestibular rehabilitation, further examination, neuroimaging, psychotherapy etc.).<sup>3,6-9</sup> However, the complexity of the etiology of vertigo sometimes makes it difficult to make a definitive diagnosis or to localize the lesion. This difficulty may be accompanied by the lack of equipment or insufficient capacity of the facility. This situation may force the clinician to overuse or misuse symptomatic treatment, and in some cases, the treatment is limited to symptomatic treatment.

There are studies in the literature examining the approaches of various physician groups to vertigo patients.<sup>10,11</sup> The aim of this study is to investigate the approaches of otolaryngologists working in different institutions and organizations in Türkiye to pharmacological treatment of vertigo through an online questionnaire.

## MATERIAL AND METHODS

The study protocol was approved by Ankara University Faculty of Medicine Human Research Ethics Committee (date: May 21, 2021, no: İ4-281-21). All participants signed an informed consent approving analysis of their answers, and publication of the anonymous data.

This study was conducted in line with the principles of the Declaration of Helsinki.

Survey questions were prepared by experienced ENT specialists and audiologists based on similar studies.<sup>10-13</sup> After the pilot study, a 15-item web-based questionnaire was delivered to ENT specialists via Google Forms (Alphabet Inc., USA). The survey was available for 6 months. Snowball sampling method was used.

Survey questions were composed of multiple-choice answers, except for the drug related question. The questions were divided into 4 groups: demographic questions (Q. 1-3), questions about vertigo

APPENDIX 1: Questionnaire
1. How many years of experience do you have?
2. What type of institution/hospital do you work for?
3. How many patients do you examine on average per day?
4. How many minutes do you spend on average for a vertigo patient?
5. Do you think that you perform enough vestibular examination for vertigo patients?
6. Do you think you spare enough time for vertigo patients?
7. Is there a vestibular evaluation laboratory in your institution?
8. Do you have the opportunity to easily access this laboratory and refer patients?
9. How many vertigo patients do you prefer symptomatic medical treatment without specific diagnosis?
10. How long it takes medical treatment in chronic vestibular diseases?
11. How long it takes medical treatment in acute vestibular diseases?
12. Which of the following drugs do you prescribe to vertigo patients?
13. How many of the BPPV patients do you treat only performing the repositioning maneuver?
14. How many of the BPPV patients do you prefer only medical treatment?
15. How many of the BPPV patients do you prefer combine treatment (medical and maneuver)?

patients (Q. 4-8), medical treatment approaches (Q. 9-12), and benign paroxysmal positional vertigo (BPPV) (Q. 13-15) (Appendix 1).

## STATISTICAL ANALYSIS

Statistical analyses were performed using IBM SPSS 25.0 (IBM, USA) package program. Numerical variables were expressed as mean and standard deviation, and number and percentage indicated categorical variables.

## RESULTS

Out of 591 ENT specialists invited, 154 ENT specialists answered the questionnaire, giving a response rate of 26.05%. The majority (31.3%) of the participants were experts with 15-20 years of experience. Thirty-nine per cent of the participants stated that they work in a public hospital. More than half (55.6%) of the participants reported seeing more than 25 patients per day. Demographic characteristics of the participants are presented in Table 1.

Nearly half of the participants [71 (53.9%) participants and 78 (50.6%) participants, respectively] stated that they could not spare enough time for the vertigo patient and did not think that they perform

**TABLE 1:** Demographic characteristics of the participants.

	Number of participants	%
<b>Level of experience</b>		
1-5 years	7	4.7
5-10 years	27	18
10-15 years	36	24
15-20 years	47	31.3
<20 years	37	22
<b>Workplace</b>		
Public hospital	60	39
Private hospital	21	13.6
University hospital	42	27.3
Private clinic	31	20.1
<b>Average number of patients per day</b>		
5-10	5	3.3
10-15	8	5.2
15-20	23	15
20-25	13	8.5
>25	85	55.6
Other	20	12.4

enough vestibular examination. The data on the vertigo patients that the participants examined daily are given in Table 2. While 72 (47.1%) participants stated that there is a vestibular evaluation laboratory in their institution, 44 (61.1%) of these participants answered yes to the question: “Do you have the opportunity to easily access this laboratory and direct patients?”

Thirty-five per cent of the participants stated that they started symptomatic medical treatment without a specific diagnosis. One hundred and five (68.6%)

**TABLE 2:** Data of vestibular patients.

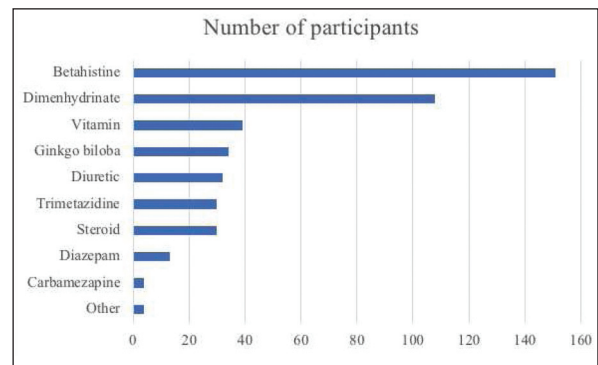
	Number of participants	%
<b>Average number of vertigo patients per day</b>		
1-3	51	31.1
3-5	52	33.8
5-7	28	18.2
7-10	20	13
Other	4	3.9
<b>Average time takes a vertigo patient</b>		
5-10 min	70	45.55
10-15 min	40	26
15-20 min	25	16.2
>20 min	19	12.25

min: Minute.

participants stated that they were prescribed drugs according to general symptoms. The drugs prescribed by the experts are given in Figure 1, and the data of the medical vertigo treatment questions are given in Table 3. The data of the questions about medical treatment for BPPV patients are given in Table 4.

## DISCUSSION

The complexity of the vestibular system and the limited access to the vestibular testing equipment occasionally limit the adequate evaluation and treatment of patients with vertigo.<sup>4,14</sup> Thus the diagnosis of



**FIGURE 1:** The drugs prescribed by ENT specialists. ENT: Ear, nose, and throat.

**TABLE 3:** Data of medical vertigo treatment.

<b>How many patients with vertigo do you prefer symptomatic medical treatment without specific diagnosis?</b>		
None	35	22.7
0-30%	54	35.1
30-50%	30	19.5
50-70%	24	15.6
70-90%	9	5.8
All	2	1.3
<b>How long does it take medical treatment in chronic vestibular diseases?</b>		
<1 month	17	11.2
1-3 month	60	39.5
3-6 month	40	26.3
6-9 month	13	8.6
9-12 month	6	3.9
>12 month	18	10.5
<b>How long does it take medical treatment in acute vestibular diseases?</b>		
<1 month	95	62.5
1-3 month	50	32.9
>3 months	9	4.6

**TABLE 4:** Data of medical treatment of BPPV.

	Number of participants	%
How many of the BPPV patients do you only perform the repositioning maneuver?		
None	36	23.4
Some	49	31.8
All	69	44.8
How many of the BPPV patients do you prefer only medical treatment?		
None	72	46.8
Some	64	41.6
All	18	11.7
How many of the BPPV patients do you prefer to combine treatment (medical and maneuver)?		
None	31	20.1
Some	88	57.1
All	35	22.7

BPPV: Benign paroxysmal positional vertigo.

these patients requires an integrated multidisciplinary workout and dedicated teamwork.<sup>15</sup> These circumstances sometimes force clinicians to prescribe vestibular suppressants without making accurate diagnosis.

The results of this study indicate that almost half of the ENT specialists could not spare enough time and make adequate vestibular examinations in these patients. This may be due to different reasons such as the daily high number of patients or the difficulty in accessing the vestibular laboratory.

Acute vertigo attack is a risk factor for falls thus requiring an immediate symptomatic treatment plan.<sup>14</sup> For this purpose, numerous pharmacological agents have been used with different molecular mechanisms.<sup>16,17</sup> A Cochrane database study reports that betahistine (SERC, USA) is the most commonly prescribed agent in patients with vertigo.<sup>18</sup> Similar results were found in this study as well; 151 out of 154 participants prescribe betahistine. The positive effect of betahistine on symptom relief has been well studied in previous studies.<sup>15,19</sup> Della Pepa et al. indicated the importance of objective physical examination and laboratory findings on treatment planning with betahistine.<sup>20</sup> However, in a study conducted with 13 countries, it was shown that two-thirds of the subjects diagnosed with vertigo were prescribed betahistine as a result of the initial evaluation, regardless of the etiology.<sup>21</sup> In our study, consistent with the literature,

clinicians mostly decide the treatment plan according to the general symptoms of the patients rather than objective laboratory findings. The most common reason for this trend is the lack of access to adequate vestibular testing equipment, as stated by about half (47.1%) of the patients.

On the other hand, misuse or uncontrolled long-term use of the vestibular suppressants may result in elongation of the central compensation period and cause addiction problems.<sup>17</sup> In particular, excessive use of pharmacotherapy for the treatment of vertigo in the elderly may hinder the development of the compensatory mechanism after a vertigo attack.<sup>6</sup> In addition, it should be emphasized that the treatment is not permanent unless the main diagnosis.<sup>22</sup>

Considering all these, the importance of vestibular laboratory evaluation in the diagnosis of vertigo in order to plan the right treatment and prevent inadequate drug use becomes clear. Another dimension in the medical treatment of vertigo is the duration of the use of drugs. In this case, again, the etiology of vertigo has critical importance. The duration of medical treatment varies according to the acute or chronic nature of the underlying cause, the attacks, the drugs, and the tolerance level of the patient. The majority of the physicians in this study stated that they prescribed medication for 1-3 months in chronic vestibular diseases and less than 1 month in acute vestibular diseases.

As it is known, one of the most common causes of peripheral vertigo is BPPV.<sup>17</sup> Although repositioning maneuvers (RPM) are generally preferred in the treatment, it has been observed in various studies that combined treatment with drugs has better outcomes.<sup>8,14,18-20</sup> As a result of our study, it was observed that 44.8% of the participants tended to apply RPM alone, while 22.7% prefer medical treatment and RPM together in the treatment of BPPV.

## CONCLUSION

Vertigo treatment is a complex process that requires a multidimensional, often multidisciplinary approach depending on its etiology. It is underlined that interdisciplinary cooperation is necessary in cases of difficult balance disorders.<sup>6,7,23,24</sup> Clinicians in medical

treatment should adopt an individually tailored pharmacotherapy approach, avoiding the use of multiple drugs, considering patient comfort, long-term recovery, side effects, and the interaction of drugs with other treatment modalities such as surgery and vestibular rehabilitation.

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### Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or mem-

bers of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

### Authorship Contributions

**Idea/Concept:** Mine Baydan Aran, Emre Ocak, Z. Çiler Büyükkatalay, Suna Tokgöz Yılmaz; **Design:** Mine Baydan Aran, Emre Ocak; **Control/Supervision:** Z. Çiler Büyükkatalay, Suna Tokgöz Yılmaz; **Data Collection and/or Processing:** Mine Baydan Aran, Emre Ocak; **Analysis and/or Interpretation:** Mine Baydan Aran, Emre Ocak; **Literature Review:** Mine Baydan Aran; **Writing the Article:** Mine Baydan Aran, Emre Ocak; **Critical Review:** Z. Çiler Büyükkatalay, Suna Tokgöz Yılmaz; **References and Fundings:** Mine Baydan Aran, Emre Ocak, Z. Çiler Büyükkatalay, Suna Tokgöz Yılmaz; **Materials:** Mine Baydan Aran, Emre Ocak, Z. Çiler Büyükkatalay, Suna Tokgöz Yılmaz.

## REFERENCES

- Barbosa F, Villa TR. Vestibular migraine: diagnosis challenges and need for targeted treatment. *Arq Neuropsiquiatr*. 2016;74(5):416-22. [Crossref] [PubMed]
- Numata K, Shiga T, Omura K, Umibe A, Hiraoka E, Yamanaka S, et al. Comparison of acute vertigo diagnosis and treatment practices between otolaryngologists and non-otolaryngologists: A multicenter scenario-based survey. *PLoS One*. 2019;14(3):e0213196. [Crossref] [PubMed] [PMC]
- Plescica F, Salvago P, Dispenza F, Messina G, Cannizzaro E, Martines F. Efficacy and pharmacological appropriateness of cinnarizine and dimenhydrinate in the treatment of vertigo and related symptoms. *Int J Environ Res Public Health*. 2021;18(9):4787. [Crossref] [PubMed] [PMC]
- Strupp M, Dieterich M, Brandt T. The treatment and natural course of peripheral and central vertigo. *Dtsch Arztebl Int*. 2013;110(29-30):505-15; quiz 515-6. [PubMed] [PMC]
- Berisavac II, Pavlović AM, Trajković JJ, Šternić NM, Bumbaširević LG. Drug treatment of vertigo in neurological disorders. *Neurol India*. 2015;63(6):933-9. [Crossref] [PubMed]
- Casani AP, Gufoini M, Capobianco S. Current insights into treating vertigo in older adults. *Drugs Aging*. 2021;38(8):655-70. [Crossref] [PubMed] [PMC]
- Hain TC. Use and misuse of medications in the treatment of dizziness. *CONTINUUM: Lifelong Learning in Neurology*. 2006;12(4):168-88. [Crossref]
- Hain TC, Uddin M. Pharmacological treatment of vertigo. *CNS Drugs*. 2003;17(2):85-100. [Crossref] [PubMed]
- Rascol O, Hain TC, Brefel C, Benazet M, Clanet M, Montastruc JL. Antivertigo medications and drug-induced vertigo. A pharmacological review. *Drugs*. 1995;50(5):777-91. [Crossref] [PubMed]
- Kara İ, Yıldız MG, Gümüştakım RŞ, Doğaner A, Sağıroğlu S, Bilal N, et al. Aile hekimlerinin vertigo farkındalığının değerlendirilmesi: kesitsel bir çalışma [Evaluation of family physician's awareness of vertigo: a cross-sectional study]. *Türkiye Aile Hekimliği Dergisi*. 2021;25(2):59-65. [Crossref]
- Ardıç FN, Mengi E, Kara CO. Vertigo'lu hastalara Türk kulak burun boğaz hekimlerinin genel yaklaşımı: anket çalışması [General approach of Turkish otolaryngologists to patients with vertigo: a survey study]. *KBB-Forum*. 2019;18(3):178-87. [Link]
- von Bredow D, Toussi M, Samad A, Kaplan S, Domahidy M, de Voogd H, et al. Evaluation of the effectiveness of risk minimization measures for trimetazidine: A cross sectional joint PASS survey among physicians in selected European countries. *Pharmacoepidemiol Drug Saf*. 2018;27(12):1385-92. [Crossref] [PubMed]
- Alyahya D, Kashoo FZ. Perception, knowledge, and attitude of medical doctors in Saudi Arabia about the role of physiotherapists in vestibular rehabilitation: a cross-sectional survey. *PeerJ*. 2022;10:e13035. [Crossref] [PubMed] [PMC]
- Scholtz AW, Ilgner J, Loader B, Pritschow BW, Weisshaar G. Cinnarizine and dimenhydrinate in the treatment of vertigo in medical practice. *Wien Klin Wochenschr*. 2016;128(9-10):341-7. [Crossref] [PubMed] [PMC]
- Ramos Alcocer R, Ledezma Rodríguez JG, Navas Romero A, Cardenas Nu-ez JL, Rodríguez Montoya V, Deschamps JJ, et al. Use of betahistine in the treatment of peripheral vertigo. *Acta Otolaryngol*. 2015;135(12):1205-11. [Crossref] [PubMed]
- Amini A, Heidari K, Kariman H, Taghizadeh M, Hatamabadi H, Shahrami A, et al. Histamine antagonists for treatment of peripheral vertigo: a meta-analysis. *J Int Adv Otol*. 2015;11(2):138-42. [Crossref] [PubMed]
- Huppert D, Strupp M, Mückter H, Brandt T. Which medication do I need to manage dizzy patients? *Acta Otolaryngol*. 2011;131(3):228-41. [Crossref] [PubMed]
- Murdin L, Hussain K, Schilder AG. Betahistine for symptoms of vertigo. *Cochrane Database Syst Rev*. 2016;2016(6):CD010696. [Crossref] [PubMed] [PMC]
- Sanchez-Vanegas G, Castro-Moreno C, Buitrago D. Betahistine in the treatment of peripheral vestibular vertigo: results of a real-life study in primary care. *Ear Nose Throat J*. 2020;99(6):356-60. [Crossref] [PubMed]
- Della Pepa C, Guidetti G, Eandi M. Betahistine in the treatment of vertiginous syndromes: a meta-analysis. *Acta Otorhinolaryngol Ital*. 2006;26(4):208-15. [PubMed] [PMC]
- Agus S, Benecke H, Thum C, Strupp M. Clinical and demographic features of vertigo: findings from the REVERT Registry. *Front Neurol*. 2013;4:48. [Crossref] [PubMed] [PMC]
- Singh KR, Singh M. Current perspectives in the pharmacotherapy of vertigo. *Otorhinolaryngol Clin Int J*. 2012;4(2):81-5. [Crossref]
- Zatonski T, Temporale H, Holanowska J, Krecicki T. Current views on treatment of vertigo and dizziness. *J Med Diagn Meth*. 2014;2(150):2. [Crossref]
- Di Mizio G, Marciàno G, Palleria C, Muraca L, Rania V, Roberti R, et al. Drug-drug interactions in vestibular diseases, clinical problems, and medico-legal implications. *Int J Environ Res Public Health*. 2021;18(24):12936. [Crossref] [PubMed] [PMC]