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The Value of Bedside Tests in Differentiating Peripheral and Central Vertigo in the ED

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Abstract

Aim: This study aims to differentiate peripheral from central vertigo in patients presenting to the emergency department (ED) with complaints of dizziness, using medical history, physical examination, bedside tests, and blood tests.

Materials and Methods: This prospective, observational, cross-sectional study was conducted in the Adult ED at the Afyonkarahisar Health Sciences University Faculty of Medicine between June 24, 2024, and April 24, 2025. Patients aged 18 years and older who presented to the ED with complaints of dizziness and who consented to participate in the study were included. Data on patient demographics, presenting complaints, medical history, bedside test results and scores, neurological examination findings, vital signs, and laboratory results were recorded on a form. Descriptive statistics were used in addition to Chi-square tests, t-tests, and Mann-Whitney U tests for group comparisons. Values with a p-value below 0.05 were considered statistically significant.

Results: Peripheral vertigo was present in 77.2% (n=78) of the 101 patients included in the study. The mean age of patients with central vertigo was 69.79±9.89 years, while the mean age of patients with peripheral vertigo was 52.84±17.07 years (p<0.001). Central vertigo was significantly more prevalent among patients with a history of brain tumors (p=0.033), diabetes mellitus (DM) (p=0.001), and atrial fibrillation (AF) (p=0.016). Conversely, peripheral vertigo was significantly more prevalent among patients with a history of alcohol use (p=0.036). We found that in patients with central vertigo, the STANDING algorithm showed central causes at a significant rate; the head impulse test was negative, the skew test was positive, and vertical nystagmus accompanied it (p<0.001). Laboratory tests showed that levels of glucose (p=0.010), C-reactive protein (CRP) (p=0.002), and the glucose-to-K^+ ratio (p=0.002) were significantly higher in patients with central vertigo. Albumin levels were lower in patients with central vertigo than in those with peripheral vertigo (p<0.001).

Conclusion: The study found that advanced age, acute cerebrovascular accident, brain tumor, DM, AF, history of alcohol use, neurological examination findings, $ABCD^2$, TriAGe+ score, head impulse, nystagmus, test of skew test, and STANDING algorithm, blood glucose, CRP, albumin level, and glucose/K+ ratio as parameters that can be used to differentiate between central and peripheral vertigo.

Keywords: Peripheral vertigo, central vertigo, HINTS test, $ABCD^2$ score, TriAGe+ score, STANDING algorithm

Introduction

Vertigo, defined as dizziness, imbalance, and a spinning sensation, affects 20% of the population and is one of the most common causes (4%) of emergency department (ED) visits (1-3). Vertigo can be caused by many conditions, such as hypoglycemia, hypovolemia, metabolic disorders, cardiac conditions, and ear disorders. While peripheral vertigo causes are identified in 80% of cases, central events such as cerebrovascular accident (CVA), transient ischemic attack (TIA), intracranial hemorrhage (ICH), and malignancy have been detected in 15-20% of cases (4,5). A detailed medical history, physical and neurological examinations, and, if necessary, blood tests and imaging methods are crucial for distinguishing between peripheral and central vertigo. In addition, bedside tests and scoring systems that are not commonly used in ED practice but are cost-free and can distinguish central vertigo, such as the head impulse, nystagmus, test of skew (HINTS) test, STANDING algorithm, $ABCD^2$, and TriAGe+ score, are also available.

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The HINTS test is highly specific (82-100%); it is performed by combining the head impulse test (HIT), which evaluates the vestibulo-ocular reflex and corrective eye movements observed in peripheral pathologies; the nystagmus assessment, which evaluates nystagmus that can be reversible, vertical, or rotatory, in central pathologies; and the skew test, which detects a refocusing movement when one eye is closed and then opened, occurring in lesions of the supranuclear nuclei associated with vision in the brainstem (6). The significance of any one of the three is sufficient for central pathologies. A centrally significant test has been shown to be more sensitive than brain diffusion magnetic resonance (BDMR) in diagnosing acute stroke within the first 48 hours of symptoms. (7). The STANDING algorithm is a four-step procedure with high specificity (71.8%-94.3%) and sensitivity (93.4%-100%) for identifying central pathologies. It evaluates spontaneous versus positional nystagmus, nystagmus direction, HIT, and balance (8). The ABCD² score is used to determine stroke risk after a TIA. It considers age, blood pressure, clinical findings, symptom duration, and diabetes status. A score of 0-3 indicates low risk, 4-5 indicates moderate risk, and 6-7 indicates high risk (9). The TriAGe+ score has a similar diagnostic value to that of imaging tests and can easily detect CVA-related vertigo early. It consists of components such as neurological findings, symptom duration, vascular risk factors, age, and vital signs (10). For patients with vertigo, TriAGe+ scores of less than 5 indicate low risk, scores of 5 to 7 indicate moderate risk, scores of 8 to 9 indicate high risk, and scores greater than 9 indicate very high risk.

The study evaluates diagnostic parameters, particularly bedside tests, that differentiate peripheral from central vertigo in patients presenting to the ED with dizziness.

Materials and Methods

This prospective, observational, cross-sectional study was conducted at the Afyonkarahisar Health Sciences University Faculty of Medicine between 06.07.2024 and 04.24.2025 after obtaining approval from the Afyonkarahisar Health Sciences University Faculty of Medicine Clinical Research Ethics Committee (approval no. 2024/4). Our study was conducted prospectively in an adult ED. Patients aged 18 years and older who presented to the ED with complaints of dizziness and consented to participate in the study were included. Those with hypovolemia, hemorrhage, hypoglycemia, arrhythmia, acute coronary syndrome (ACS), electrolyte imbalance, acid-base imbalance, renal failure, intoxication, altered consciousness, dementia, unstable vital signs, acute trauma, refusal to consent, or those who were pregnant or under 18 years of age were excluded. All patients within a specific time period who were eligible for inclusion in our study were included. The 101 patients included in the study had demographic characteristics such as age and gender, presenting complaints (vertigo, hearing loss, tinnitus, ear pain, ear discharge, headache, nausea, vomiting, visual impairment), medical histories, bedside tests and scores (STANDING algorithm, HINTS test, ABCD² score, TriAGe+ score), neurological examination findings, vital signs (blood pressure, pulse), complete blood count, biochemical tests [hemoglobin, platelet (PLT), neutrophils, monocytes, lymphocytes, lactate, Mg^{2+}, glucose, potassium (K^+), CRP, albumin, and certain ratios (neutrophil/lymphocyte ratio (NLR), PLT/lymphocyte, monocyte/lymphocyte, glucose/K^+, CRP/albumin], computerized tomography (CT) and BDMR examination results in indicated patients were recorded in the data collection form we prepared. Patients with advanced age, diabetes mellitus (DM), hypertension (HT), atrial fibrillation (AF), stroke, and a history of central nervous system disorders; those with physical examination findings such as balance disorders, extremity weakness, speech disorders, and facial paralysis; those without a diagnosis of peripheral vertigo who experienced dizziness for the first time and did not respond to medical treatment; and those with central vertigo indicated by the HINTS test, STANDING algorithm, TriAGE score, and ABCD² score underwent central imaging. Patients in whom pathology was detected on central imaging were diagnosed with central vertigo. A third-year emergency medicine resident, blinded to the study, performed bedside tests. They were administered at the bedside in an adult ED. Factors such as patient consciousness level and mobility could affect the feasibility of the test. Only patients able to perform the tests were included in the study.

Statistical Analysis

The SPSS version 22.0 was used for statistical analysis. The data recorded in the data collection form were transferred to the statistical program. For descriptive statistics, the mean, standard deviation, median and maximum values, and percentages were used. To evaluate the normal distribution of the data, histograms, plots, the coefficient of variation, skewness, kurtosis, and normality tests (Kolmogorov-Smirnov, Shapiro-Wilk) were used. To compare groups, the chi-square test (Pearson's Chi-square, Fisher's exact test if the number of observations per cell is less than five) was used for categorical data; the t-test was used for normally distributed data; and the Mann-Whitney U test was used for non-normally distributed data. Values with a p-value below 0.05 were considered statistically significant. All patients within a specific time period who met the inclusion criteria were included in our study. The number of patients was determined using a power analysis. A total of 101 patients meeting our established study criteria were included. ROC analysis could not be performed because the statistical program we used did not have data from a sufficient number of patients.

Results

Peripheral vertigo was detected in 77.2% (n=78) and central vertigo in 22.8% (n=23) of the 101 patients included in the study; central vertigo was confirmed by imaging methods.

Descriptive statistics and comparisons of patient data for the central and peripheral vertigo groups are presented in Tables 1-3. Table 1 includes only categorical data (known diseases, complaints, examination results, bedside tests) that were present. The mean age of the patients included in the study was determined to be 56.87±17.22. A statistically significant difference was found between central and peripheral vertigo in age (p<0.001, t-test). The mean age of patients with central vertigo (69.79±9.89) was higher than that of patients with peripheral vertigo (52.84±17.07). 53 patients (52.5%) were female, and 48 (47.5%) were male. No significant difference in gender distribution was observed between central and peripheral vertigo (p=0.974, Pearson Chi-square).

Comorbidities, smoking, and alcohol use were evaluated. Central vertigo was more common than peripheral vertigo among patients with a history of cerebrovascular disease; this difference was of borderline statistical significance (p=0.059). Central vertigo was significantly more common than peripheral vertigo in patients with a history of brain tumor (p=0.033), DM (p=0.001), or AF (p=0.016). Peripheral vertigo was significantly more common than central vertigo in patients with a history of alcohol use (p=0.036). No significant differences were found between the two vertigo groups with respect to other diseases (p=0.05). When the complaints accompanying the patients' dizziness were examined, the most common associated symptoms were headache (76.2%) and nausea (71.3%), but no significant difference was found between central and peripheral vertigo for hearing loss, tinnitus, earache, headache, and nausea (p=0.05).

On physical examination, a significant difference was detected between central and peripheral vertigo regarding facial asymmetry, weakness, and loss of balance (p<0.001). These findings were more common in patients with central vertigo. With respect to speech disorder, a borderline significant difference was observed between the two groups (p=0.055). Positive STANDING algorithm results, HIT negativity, and positive Skew test results were found more frequently in patients diagnosed with central vertigo than in those diagnosed with peripheral vertigo (p<0.001). Nystagmus was more frequently detected as vertical in patients with central vertigo than in those with peripheral vertigo (p<0.001). The median ABCD^2 score was 3 (0-7), and the median TriAGe+ score was 5 (0-17). The median ABCD^2 and TriAGe+ scores were significantly higher in patients with central vertigo than in those with peripheral vertigo (p<0.001).

When laboratory results were evaluated, the median values of glucose, glucose/K+ ratio, and CRP were significantly higher in

Table 1. Descriptive statistics of data and comparison of the groups

	All patients mean ± SD, n (%), med (min-max)	**Central vertigo mean ± SD, n (%), med (min-max)**	**Peripheral vertigo mean ± SD, n (%), med (min-max)**	**p**
Age (years)	56.87±17.22	69.79±9.89	52.84±17.07	**<0.001**^{t}
Gender				
Female	53 (52.5%)	12 (52.2%)	41 (52.6%)	0.968^{x2}
Male	48 (47.5%)	11 (47.8%)	37 (%47.4%)	
Resume				
CVA	5 (5%)	4 (16.7%)	1 (1.3%)	0.059^f
Brain tumor	7 (6.9%)	5 (20.8%)	2 (2.6%)	**0.033**^{f}
HT	46 (45.5%)	12 (50%)	34 (44.2%)	0.230^{x2}
HL	17 (16.8%)	4 (16.7%)	13 (16.9%)	0.186^f
DM	37 (36.6%)	14 (58.3%)	23 (29.9%)	**0.00**^{x2}
HF	10 (52.9%)	0 (0%)	10 (13%)	0.116^f
Asthma/COPD	6 (5.9%)	4 (16.7%)	2 (2.6%)	0.102^f
Malignancy	16 (15.8%)	8 (33.3%)	8 (10.4%)	0.314^{x2}
CAD	12 (11.9%)	1 (4.2%)	11 (14.3%)	0.525^f
AF	6 (5.9%)	4 (16.7%)	2 (2.6%)	**0.016**^{f}
Smoke	43 (42.6%)	4 (16.7%)	39 (50.6%)	0.145^f
Alcohol	15 (14.9%)	1 (4.2%)	14 (18.2%)	**0.036**^{f}

^{t}: t-test, ^{x2}: Chi-square test, ^{f}: Fisher's exact test, HT: Hypertension, HL: Hyperlipidemia, DM: Diabetes mellitus, HF: Heart failure, COPD: Chronic obstructive pulmonary disease, CAD: Coronary artery disease, **CVA**: Cerebrovascular accident, AF: Atrial fibrillation, SD: Standard deviation

patients with central vertigo, whereas the median albumin value was lower (p=0.010, p=0.010, p=0.002, p<0.001). No significant differences were found between the central and peripheral vertigo groups with respect to other laboratory results (p>0.05).

Table 2. Descriptive statistics of data and comparison of the groups

	All patients mean ± SD, n (%) med (min-max)	Central vertigo mean ± SD, n (%) med (min-max)	Peripheral vertigo mean ± SD, n (%) med (min-max)	p
Complaint	8 (7.9%)	3 (12.5%)	5 (6.5%)	0.358[f]
Hearing loss	32 (31.7%)	5 (20.8%)	27 (35.1%)	0.478[x2]
Tinnitus	14 (13.9%)	2 (8.3%)	12 (15.6%)	0.595[f]
Earache	77 (76.2%)	17 (70.8%)	60 (77.9%)	0.147[x2]
Headache	72 (71.3%)	19 (79.2%)	53 (68.8%)	0.577[x2]
Nausea	77.28±11.62	79.83±12.47	76.49±11.31	0.166[t]
Examination findings	127.67±19.70	128.12±23.94	127.53±23.94	0.127[t]
Pulse (beats/min)	71.98±14.14	73.12±17.18	71.62±13.16	0.290[t]
SBP (mmHg)	7 (6.9%)	6 (25)	1 (1.3%)	**<0.001[f]**
DBP (mmHg)	8 (7.9%)	8 (33.3%)	0 (0%)	**<0.001[f]**
Facial asymmetry	10 (9.9%)	5 (20.8%)	5 (6.5%)	0.055[f]
Loss of strength	43 (42.6%)	17 (70.8%)	26 (33.8%)	**<0.001[x2]**
Speech impairment				
Loss of balance				

[t]: t-test, [x2]: Chi-square test, [f]: Fisher's exact test, SD: Standard deviation, SBP: Systolic blood pressure

Table 3. Descriptive statistics of data and comparison of the groups

	All patients mean ± SD, n (%) med (min-max)	Central vertigo mean ± SD, n (%). med (min-max)	Peripheral vertigo mean ± SD, n (%) med (min-max)	p
Bedside tests	33 (32.7%)	15 (62.5%)	18 (23.4%)	**<0.001[x2]**
STANDING*	20 (19.8%)	12 (50%)	8 (10.4%)	**<0.001[x2]**
HIT (-)	24 (23.8%)	24 (100%)	0 (0%)	**<0.001[f]**
Nystagmus**	20 (19.8%)	13 (54.2%)	7 (9.1%)	**<0.001[x2]**
Skew test (+)	3 (0-7)	4 (2-7)	2 (0-5)	**<0.001[m]**
$ABCD^2$ score	5 (0-17)	9 (2-17)	4 (0-12)	**<0.001[m]**
TriAGe+ score	16 (7-48)	18 (12-48)	16 (7-48)	0.258[m]
Laboratory	2.05 (1.26-2.49)	1.98 (1.27-2.40)	2.06 (1.26-2.49)	0.444[m]
Lactate (mg/dL)	125 (70-489)	154 (96-489)	118 (70-471)	**0.010[m]**
Mg (mg/dL)	4.60 (0.00-7.00)	6.60 (0.60-381)	4.40 (0.10-188)	**0.002[m]**
Glucose (mg/dL)	3.00 (0.10-3.81)	4.06 (2.53-4.66)	4.42 (2.58-5.64)	**<0.001[m]**
CRP (mg/L)	4.45±0.48	4.41±0.45	4.46±0.49	0.795[t]
Albumin (g/dL)	5.51(1.31-19.99)	5.26 (1.31-19)	5.58 (2.32-17.83)	0.637[m]
K^+ (mg/dL)	1.81±1.01	1.72±1.03	1.83±1.00	0.627[t]
Neutrophils (10^3/uL)	236 (3.24-561)	231 (11-561)	237 (3.24-421)	0.590[m]
Lymphocyte (10^3/uL)	0.60 (0.09-3.83)	0.58 (0.16-1.21)	0.61 (0.09-3.83)	0.369[m]
PLT (10^3/uL)	28.63 (15.56-104)	37.40 (17.78-104)	26.85 (15.56-82.93)	**0.002[m]**
Monocyte (10^3/uL)	1.09 (0.02-126)	1.60 (0.14-126)	1.04 (0.02-45.49)	0.176[m]
Glucose/K^+	3.37 (0.92-29.49)	3.70 (0.92-17.95)	3.32 (0.96-29.49)	0.626[m]
CRP/albumin	143 (2-1196)	144 (2-1196)	143 (5-547)	0.503[m]
Neutrophil/lymphocyte	0.33 (0.08-6.08)	0.32 (0.11-2.33)	0.33 (0.08-6.08)	0.738[m]
PLT/lymphocyte				
Monocyte/lymphocyte				

[x2]: Chi-square test, [t]: t-test, m: Mann Whitney U test, [f]: Fisher's exact test, CVA: Cerebrovascular accident, HT: Hypertension, HL: Hyperlipidemia, DM: Diabetes mellitus, HF: Heart failure, COPD: Chronic obstructive pulmonary disease, CAD: Coronary artery disease, AF: Atrial fibrillation, SBP: Systolic blood pressure, DBP: Diastolic blood pressure, *: Central, **: Vertical, Mg: Magnesium, CRP: C-reactive protein, (mg/dL), K^+: Potassium, PLT: Platelet

CT was performed in 64.6% (n=65) of patients; BDMR imaging was performed in 61.4% (n=62). CT detected ischemia, hemorrhage, or mass in 12 patients, whereas BDMR detected ischemia or mass in 23 patients.

Discussion

Dizziness is one of the most common complaints reported by patients visiting the ED. It accounts for 4% of ED visits in the United States, and more than 30% of people experience dizziness at some point in their lives (1). Vertigo can be considered a sign of cerebral circulation ischemia; patients with acute vertigo who visit the ED have twice the likelihood of experiencing cardiovascular events or stroke compared to those without acute vertigo during a three-year follow-up (11). It has been observed that 2-13.4% of vertigo cases presenting to the ED are due to stroke, and more than 30% of these cases are missed by ED physicians during the initial visit (12). Vertigo can arise from many causes, most of which are benign, leading to diagnostic difficulties and the potential overlooking of central causes. Therefore, a well-taken medical history, a detailed physical examination, bedside diagnostic tests that are noninvasive and cost-free, laboratory tests, and central imaging methods, if necessary, will greatly contribute to distinguishing peripheral from central vertigo, establishing the correct diagnosis, initiating treatment early, and reducing mortality and morbidity due to central causes. In the study, consistent with the literature, 22.8% patients had vertigo due to central causes, and older patients were found to present with central vertigo (13-15). It is known that vertigo is more common in women (13,16). Chronic diseases such as DM, HT, coronary artery disease (CAD), hyperlipidemia (HL), AF, and cancer are risk factors for central vertigo. Among patients with central vertigo, 28% had a history of stroke; there was no significant difference between central and peripheral vertigo in terms of past history of AF, DM, HT, and HL, whereas a history of CVA was significantly associated with central vertigo. Studies have found that a history of HT is associated with a significant difference in central vertigo, but a history of DM, HL, CVA, or AF is not; asthma is associated with Meniere's disease; and asthma and chronic obstructive pulmonary disease are not associated with vertigo (17). In our study, central vertigo was more common in patients with a history of CVA, brain tumor, DM, and AF. These differing results may be related to the population's dietary habits, traditions, socioeconomic status, education, and culture, or to the number of patients included in the study. Similar to our study, studies have found no statistically significant relationship between smoking and central or peripheral vertigo (1,15). However, we found a significantly higher prevalence of peripheral vertigo among patients who consumed alcohol. Another study found a significant relationship between alcohol use and central vertigo (16). These differing results may be due to socioeconomic status, religious beliefs, and the fact that older patients, in whom central vertigo is more common, have more comorbidities and take more medications, which may reduce their alcohol consumption.

Headache and vomiting that accompanied vertigo, as well as auditory symptoms, did not aid in the differential diagnosis. It was determined that headache and vomiting were more common in patients with central vertigo, and there was no significant difference in auditory symptoms (17). When examining the complaints accompanying vertigo in the patients participating in our study, we found that the most common symptoms were headache (76.2%) and nausea (71.3%). Hearing loss and nausea were more common in patients with central vertigo, while tinnitus, earache, and headache were more common in patients with peripheral vertigo. However, we observed no statistically significant difference.

Studies that identify or fail to identify a relationship between high blood pressure and central vertigo when examining pulse and blood pressure, which are the most important components of the physical examination (17,18). A complete neurological examination can provide the clinician with valuable findings for the differential diagnosis of vertigo. Balance disorder, lateral findings, facial asymmetry, speech disorder, ptosis, urinary and fecal incontinence are important physical examination results that support central events (19). In our study, pulse and blood pressure did not help the clinician distinguish vertigo, but neurological examination findings were valuable for identifying central events.

The STANDING algorithm, HINTS test, ABCD^2, and TriAGe+ score, which are bedside tests, are practical, non-invasive, cost-effective, safe, and easy-to-administer methods for differentiating central from peripheral vertigo. Studies have found that HIT, vertical nystagmus, skew test, and consequently the HINTS test resulted in a significant difference in the differentiation of central and peripheral vertigo (20). Our study also found that the STANDING algorithm, HIT negativity, the presence of vertical nystagmus, skew test positivity, and, consequently, the HINTS test could significantly differentiate between patients with central and peripheral vertigo. Similar to our study, studies have found that patients with central pathology scored higher on the ABCD^2 scale (16,20,21). T he median TriAGe+ score was 5 in patients with peripheral vertigo and 9 in patients with central vertigo; the difference between the two groups was significant. A recent study by Toplu and colleagues (22) in an ED also found similar results to ours; the score was 6 for peripheral vertigo and 9 for central vertigo.

Patients presenting to the ED with vertigo typically undergo tests, including a complete blood count, electrolytes, renal and liver function tests, blood glucose, and other blood tests as appropriate to the patient's clinical presentation, to identify potential underlying causes. In our study, we also evaluated whether there was a relationship between central and peripheral vertigo using these tests. Increased lactate levels are directly related to impaired tissue oxygenation, which is associated with ischemic conditions such as cerebellar confusion. Mg is involved in numerous metabolic and biochemical events, such as neuromuscular function, regulation of oxidative stress, glucose, lipid, and protein metabolism, and cell proliferation (23). Mg deficiency is thought to cause many diseases such as migraine, chronic headaches, epilepsy, Alzheimer's disease, Parkinson's disease, and stroke. Glucose, the main energy source of cells, is critical for maintaining cellular metabolism. K^+, the most abundant cation within cells, is important in physiological events such as nerve transmission, heartbeat, muscle contraction, and maintaining normal kidney function. Studies have found that glucose and K^+ may be particularly related to stroke and that these two molecules interact with each other. By utilizing this interaction, the glucose/K^+ ratio was investigated and found to be an early prognostic factor in conditions such as ICH, CVA, and traumatic brain injury (24). CRP, similar to albumin, is an acute phase reactant associated with poor prognosis that also indicates malnutrition in critically ill patients (25). The CRP/albumin ratio may reflect inflammatory conditions and malnutrition (26). CRP may be elevated in vascular diseases and serve as a poor prognostic indicator in ischemic stroke patients. In inflammatory conditions, the neutrophil count increases while the lymphocyte count relatively decreases, and the ratio of these parameters can be used to detect inflammation (27). Furthermore, PLT and monocyte levels are increased in autoimmune diseases and inflammatory conditions. Studies investigating the PLT/lymphocyte ratio are also available. In our study, we evaluated lactate, Mg^{2+}, glucose, CRP, albumin, K^+, neutrophils, lymphocytes, PLT, monocytes, and their ratios to each other. As a result, we found that high glucose and CRP levels, the glucose/K^+ ratio, and low albumin values were significantly different for central vertigo compared to peripheral vertigo. Apart from these findings, we did not observe any significant differences between the two groups in lactate, Mg^{2+}, K^+, neutrophil, lymphocyte, PLT, monocyte, CRP/albumin ratio, NLR, PLT/lymphocyte, and monocyte/lymphocyte measurements included in the study. Studies have found significant differences between central and peripheral vertigo in terms of lymphocyte, neutrophil, NLR, and PLT results, differences in blood glucose, lactate, and CRP levels, no differences in K^+ and PLT results, and significant differences in albumin. We believe that the differing statistical results reported across studies may be related to patients' dietary habits, socioeconomic levels, lifestyles, and existing comorbidities.

Study Limitations

Our study is a single-center, prospective study. Laboratory tests were selected based on the assumption that vertigo could be metabolic in origin. Since imaging studies were not performed on all patients, they (i.e., the imaging studies) were not included in the evaluation. Patients' socioeconomic status, level of awareness, and mobility, as well as the workload and conditions of the ED, all influenced the feasibility of the tests. Since electrocardiograms (ECGs) for all patients were not available, ECGs were not included in the study. ECG was not performed on young patients without comorbidities who had previously experienced vertigo attacks and been diagnosed with peripheral vertigo, had a noisy clinical presentation, and experienced relief after examination and treatment. The diagnosis of ACS was made using ECG, cardiac markers, echocardiography when necessary, and cardiology consultation. Patients diagnosed with ACS were excluded from the study.

Conclusion

Vertigo is one of the most common reasons for visits to the ED and can arise from numerous causes. Early diagnosis and treatment are particularly important in cases of central pathologies that may be life-threatening. According to our study, obtaining a thorough medical history, carefully questioning the patient's background, performing a detailed neurological examination, and primarily conducting noninvasive bedside tests are crucial for diagnosis in patients presenting to the ED with vertigo. In particular, the emergency physician's use of bedside tests can enable the rapid identification of high-risk patients with central vertigo.

Ethics

Ethics Committee Approval: Approval from the Clinical Research Ethics Committee of Afyonkarahisar Health Sciences University Faculty of Medicine (approval no. 2024/4, date: 07.06.2024).

Informed Consent: This prospective, observational, cross-sectional study.

Footnotes

Authorship Contributions

Surgical and Medical Practices: T.A., Ş.Ö., Concept: T.A., Ş.Ö., Design: T.A., Ş.Ö., Data Collection or Processing: T.A., Analysis or Interpretation: T.A., Ş.Ö., Literature Search: T.A., Ş.Ö., Writing: T.A.

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