Evaluation of the Relationship Between Delirium, Laboratory Parameters, and Falls in Patients Admitted to the Internal Medicine Ward

Dahiliye Servisine Yatan Hastalarda Deliryum ile Laboratuvar Parametreleri ve Düşme Arasındaki İlişkinin Değerlendirilmesi

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ABSTRACT

Aim: This study aimed to evaluate the relationship between delirium, laboratory parameters, and falls in geriatric patients admitted to the internal medicine ward, focusing on differences between infectious and non-infectious delirium etiologies.

Materials and Methods: A prospective study was conducted between March 10 and May 10, 2025, involving 125 patients aged 65 years and older who were hospitalized in the Clinic of Internal Medicine of University of Health Sciences Türkiye, İstanbul Training and Research Hospital. Delirium was diagnosed with 4-AT scores ≥4. Patients were categorized into infectious and non-infectious groups. Demographics, laboratory values, delirium subtypes, fall history, fractures, and mobility status were compared. Statistical tests employed were Mann-Whitney U and chi-square.

Results: The mean age was 79.7±7.9 years, with balanced gender distribution. Infectious causes accounted for 40.8% of delirium cases; urinary tract infections were most common (19.2%). Falls averaged 1.9±1.8 in the prior year, with 20% having fall-related fractures. Hypoactive delirium predominated (70.4%), and 81.6% were mobile. No significant differences existed in age, sex, falls, fractures, or delirium subtype between groups. However, mobility was higher in the non-infectious group (p=0.030). C-reactive protein, erythrocyte sedimentation rate, leukocyte, platelet, neutrophil counts, and sodium were significantly lower in non-infectious delirium (p<0.05).

Conclusion: Delirium is common and serious in elderly inpatients, with infections as a major cause. Greater mobility in non-infectious cases may indicate lower systemic inflammation. Early diagnosis, etiology-focused management, and fall prevention are vital to improve outcomes.

Keywords: Delirium, geriatric, internal medicine

ÖZ

Amaç: Bu çalışma, dahiliye servisine yatan geriatrik hastalarda deliryum, laboratuvar parametreleri ve düşme arasındaki ilişkiyi, enfeksiyöz ve enfeksiyöz olmayan deliryum etiyolojileri açısından değerlendirmeyi amaçladı.

Gereç ve Yöntem: 10 Mart-10 Mayıs 2025 tarihleri arasında, Sağlık Bilimleri Üniversitesi, İstanbul Eğitim ve Araştırma Hastanesi Dahiliye Kliniği'ne yatırılan 65 yaş ve üzeri 125 hasta ile prospektif bir çalışma yürütüldü. Deliryum tanısı 4-AT skoru ≥4 olan hastalara konuldu. Hastalar enfeksiyöz ve enfeksiyöz olmayan gruplara ayrıldı. Demografik bilgiler, laboratuvar değerleri, deliryum alt tipleri, düşme öyküsü, kırıklar ve mobilite durumu karşılaştırıldı. İstatistiksel analizlerde Mann-Whitney U ve ki-kare testleri kullanıldı.

Bulgular: Ortalama yaş 79,7±7,9 yıl olup cinsiyet dağılımı dengeliydi. Deliryum olgularının %40,8'i enfeksiyöz nedenlere bağlıydı; en sık kabul tanısı üriner sistem enfeksiyonuydu (%19,2). Geçen yıl ortalama düşme sayısı 1,9±1,8 idi ve hastaların %20'sinde düşmeye bağlı kırık vardı. Hipoaktif deliryum yaygındı (%70,4) ve %81,6'sı hareketliydi. Gruplar arasında yaş, cinsiyet, düşme, kırık ve deliryum alt tipi açısından anlamlı fark yoktu.

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Ancak mobilite enfeksiyöz olmayan grupta anlamlı olarak yüksekti (p=0,030). C-reaktif protein, eritrosit sedimantasyon hızı, lökosit, trombosit, nötrofil sayıları ve sodyum seviyeleri enfeksiyöz olmayan grupta anlamlı olarak daha düşüktü (p<0,05).

Sonuç: Deliryum, hastanede yatan yaşlı hastalarda yaygın ve ciddi bir durum olup enfeksiyonlar önemli bir neden teşkil etmektedir. Enfeksiyöz olmayan olgularda daha yüksek mobilite, daha az sistemik enflamasyonu gösterebilir. Erken tanı, etiyolojiye yönelik tedavi ve düşme önleyici stratejiler, bu hassas hasta grubunda klinik sonuçların iyileştirilmesinde kritik öneme sahiptir.

Anahtar Kelimeler: Deliryum, geriatrik, iç hastalıkları

INTRODUCTION

Delirium is a condition characterized by alterations in attention, awareness, and cognitive function, and arises in the context of an underlying medical issue that is not more appropriately attributed to a previously diagnosed neurocognitive disorder. Numerous predisposing and precipitating factors for delirium have been identified. It is thought that, in most patients, both types of factors contribute to the onset of delirium[1]. Delirium is an extremely life-threatening and critically important clinical condition that is often overlooked by clinicians. Its etiology is multifactorial, with advanced age and neurocognitive disorders being among the most significant and commonly observed risk factors. Acute medical conditions such as infections, life-threatening organ failures, and sepsis, as well as adverse drug reactions and medical complications, often play central roles in the etiology of delirium[2].

In the United States, delirium is identified in more than 2.6 million geriatric patients aged 65 years and older each year, leading to an estimated annual healthcare expenditure exceeding $164 billion. Given its detrimental effects on patients' functional status and quality of life, as well as the substantial healthcare costs it imposes on governments, it is evident that clinicians should place greater emphasis on this critical clinical condition, approach it with increased vigilance, and prioritize early diagnosis[3].

Delirium is highly prevalent among hospitalized geriatric patients. In one study, delirium was identified in one third of patients aged 70 years and older admitted to general internal medicine wards. Among these patients, delirium was present at the time of hospital admission in half of the cases, while the other half developed delirium during the course of hospitalization[4].

In this study, we aimed to investigate the prevalence of delirium among geriatric patients hospitalized in the internal medicine ward, its distribution according to demographic characteristics, laboratory alterations based on different etiologies, and its association with falls.

MATERIALS AND METHODS

Patients

The clinical data for this study were obtained from of University of Health Sciences Türkiye, İstanbul Training and Research Hospital. A total of 356 geriatric patients who were hospitalized in the internal medicine ward for various medical reasons between March 10 and May 10, 2025, were included in the analysis. Inclusion criteria were defined as follows: individuals aged 65 years and older admitted to the internal medicine department who did not meet any exclusion criteria were included. Additionally, only patients who experienced their first episode of delirium were included. Patients with a prior history of delirium were excluded to minimize potential confounding effects.

Exclusion criteria included patients under the age of 65, those with severe cognitive impairment or a documented diagnosis of dementia, individuals with advanced hearing or visual impairment, patients with speech difficulties, foreign nationals with a potential language barrier that could impair communication, and those with incomplete medical records in the hospital information system. Additionally, patients with a history of alcohol or substance use, as well as those using central nervous system-active agents such as antidepressants, antipsychotics, anxiolytics, or mood stabilizers, were excluded to prevent potential confounding in the clinical assessment of delirium.

Based on these criteria, 231 patients were excluded from the study. A total of 125 patients met the eligibility requirements and were included in the final analysis. The Ethics Committee of University of Health Sciences Türkiye, İstanbul Training and Research Hospital granted approval for this study (decision no: 55, date: 07.03.2025). All study procedures complied with the ethical standards of the 1964 Helsinki Declaration and its later amendments. Written informed consent was obtained from all participants prior to their inclusion in the study.

Data Collection

The following variables were retrieved from the hospital's electronic health database: patients' age, sex, reason for hospitalization, hemogram and biochemical parameters,

number of falls within the past year, fall-related bone fractures, causes of delirium, delirium subtypes, and mobility status.

Delirium was diagnosed according to the 4-AT score assessed during daily bedside evaluations. The 4-AT test is a clinically practical and easily applicable screening tool composed of four components: alertness, abbreviated mental test 4, attention, and acute change or fluctuating course. Each subcomponent is scored individually. Accordingly, patients with a score of 0 were considered negative for delirium, with a low probability of cognitive impairment. Patients scoring between 1 and 3 were considered unlikely to have delirium but possibly had cognitive impairment. Those with a score of 4 or higher were considered to have delirium and were included in the study[5].

Subjects were divided into two groups based on the etiology of delirium: those with delirium due to infectious causes and those with delirium due to non-infectious causes. The relationship between these groups and clinical variables such as hematological and biochemical parameters, as well as fall history, was analyzed.

Statistical Analysis

Descriptive statistics including mean, standard deviation, median, minimum, maximum, frequency, and percentage values were used to summarize the data. Normality of the variables was evaluated by applying the Kolmogorov-Smirnov and Shapiro-Wilk tests. For the analysis of quantitative independent variables that were not normally distributed, the Mann-Whitney U test was used. For the analysis of qualitative independent variables, the chi-square test was applied, and when the assumptions of the chi-square test were not met, Fisher's exact test was used. All statistical analyses were implemented using SPSS version 27.0.

RESULTS

The mean age of the patients included in the study was 79.7±7.9 years. Among the participants, 64 patients (51.2%) were male and 61 patients (48.8%) were female. Regarding age distribution, 37 patients (29.6%) were between 65-74 years, another 37 (29.6%) were between 75-84 years, and 51 patients (40.8%) were aged 85 years or older. The most common reason for hospital admission among the patients was urinary tract infection (UTI), observed in 24 patients (19.2%). Other reasons for hospitalization are summarized in Table 1. The most frequent etiology of delirium was infection-related conditions, accounting for 51 cases (40.8%). Additional etiological factors contributing to delirium are also presented in Table 1. The mean number of falls within the past year was 1.9±1.8. Fall-related fractures were identified in 25 patients (20%). Hypoactive delirium was observed in 88 patients (70.4%), while hyperactive delirium was identified in 37 patients (29.6%). A total of 102 patients (81.6%) were classified as mobile, whereas 23 patients (18.4%) were immobile (Table 1). The primary causes of immobility among patients were sequelae of previous cerebrovascular events and immobilization secondary to fractures.

The complete blood count and biochemical parameters of all subjects included in the study are collectively presented in Table 2.

Table 1. Demographic, clinical, and delirium-related characteristics of subjects								
		Min-max			Median		Mean ± SD/n-%	
Age (year)		65.0	-	95.0	80.0		79.7	±	7.9
Gender	Male						64	51.2%
	Female						61	48.8%
Geriatric age group	65-74						37	29.6%
	75-84						37	29.6%
	>84						51	40.8%
Reason for hospitalization								
Urinary tract infection							24	19.2%
Pneumonia							20	16.0%
Gastrointestinal system bleeding							13	10.4%
Others							11	8.8%
Acute kidney injury							9	7.2%
Decompensated heart failure							8	6.4%
Malignancy workup							8	6.4%
Chronic obstructive pulmonary disease exacerbation							7	5.6%

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Table 1. Continued							Min–max		Median	Mean ± SD/n–%		

Table 1. Continued		Min-max			Median	Mean ± SD/n-%	
Catheter infection						6	4.8%
Pancreatitis						6	4.8%
Decompensated cirrhosis						5	4.0%
Cholecystitis						4	3.2%
Diabetic ketoacidosis						4	3.2%
Number of falls in the last 1 year		0.0	–	7.0	2.0	1.9 ±	1.8
Fracture due to a fall	(-)					100	80.0%
	(+)					25	20.0%
Etiology of delirium							
Infection						51	40.8%
Electrolyte imbalance						36	28.8%
Lung diseases accompanied by hypoxemia						13	10.4%
Renal failure						10	8.0%
Drug related						8	6.4%
Heart failure						6	4.8%
Liver failure						1	0.8%
Delirium type	Hypoactive					88	70.4%
	Hyperactive					37	29.6%
Mobility status	Immobile					23	18.4%
	Mobile					102	81.6%
Min: Minimum, Max: Maximum, SD: Standard deviation							

Table 2. Descriptive statistics of laboratory parameters in geriatric inpatients	Min–max			Median	Mean ± SD		
C-reactive protein (mg/L)	2.0	–	477.0	75.0	110.3	±	100.1
Erythrocyte sedimentation rate (mm/h)	2.0	–	102.0	44.0	41.3	±	29.9
White blood cell (10⁹/L)	2.7	–	30.6	9.4	10.5	±	5.2
Hemoglobin (g/dL)	5.1	–	14.8	11.4	11.1	±	2.2
Platelet count (10⁹/L)	39.0	–	604.0	256.0	283.9	±	142.4
Neutrophil (10⁹/L)	0.1	–	28.3	7.3	8.6	±	5.0
Lymphocyte (10⁹/L)	0.1	–	4.0	1.3	1.3	±	0.7
Monocyte (10⁹/L)	0.1	–	1.3	0.3	0.4	±	0.3
Total protein (g/dL)	4.2	–	9.2	6.5	6.4	±	1.0
Albumin (g/dL)	1.8	–	4.7	3.3	3.3	±	0.6
Total cholesterol (mg/dL)	76.0	–	285.0	144.0	151.5	±	46.9
Glucose (mg/dL)	69.0	–	1066.0	112.0	149.8	±	121.1
Creatinine (mg/dL)	0.4	–	8.6	1.1	1.5	±	1.3
Urea (mg/dL)	17.0	–	248.0	49.5	66.0	±	43.5
Aspartate aminotransferase (U/L)	9.0	–	326.0	28.0	39.8	±	40.4
Alanine aminotransferase (U/L)	5.0	–	156.0	27.0	31.2	±	21.2
Sodium (mEq/L)	106.0	–	168.0	132.0	131.9	±	9.8
Potassium (mEq/L)	3.2	–	6.3	4.5	4.5	±	0.8
Corrected calcium (mg/dL)	7.6	–	11.3	8.9	8.9	±	0.7

Table 2. Continued	Min–max			Median	Mean ± SD		
Phosphorus (mg/dL)	1.3	–	5.8	2.7	2.9	±	1.0
Parathyroid hormone (pg/mL)	17.2	–	234.5	57.3	89.5	±	59.2
Magnesium (mg/dL)	1.1	–	3.0	1.8	1.8	±	0.3
Vitamin B12 (pg/mL)	76.0	–	2100.0	302.0	385.2	±	273.7
Vitamin D (ng/mL)	4.5	–	86.7	13.8	18.5	±	15.7
Min: Minimum, Max: Maximum, SD: Standard deviation							

A total of 125 patients were divided into two groups based on the etiology of delirium: 51 patients were identified to have infection-related delirium, while 74 patients had delirium due to non-infectious causes. Table 3 provides a comparative overview of these two groups in terms of mean age, distribution across geriatric age categories, sex, number of falls within the past year, presence of fall-related fractures, delirium subtype, and mobility status.

There were no notable differences between the infectious and non-infectious groups regarding age, geriatric age distribution, sex, number of falls in the past year, fall-related fracture rates, or delirium subtype (p>0.05). Specifically, no statistically significant differences were observed between the geriatric age subgroups (65-74 years, 75-84 years, and ≥85 years) in terms of delirium etiology distribution (p=0.475). However, the proportion of mobile patients was significantly higher in the non-infectious group compared to the infectious group (p=0.030) (Table 3).

There were no meaningful differences between the infectious and non-infectious groups in terms of hemoglobin, lymphocyte, monocyte, total protein, albumin, and total cholesterol levels (p>0.05). Similarly, no significant differences were observed in glucose, creatinine, urea, aspartat aminotransferaz, alanin aminotransferaz, potassium, or corrected calcium levels between the two groups (p>0.05). Additionally, phosphorus, parathyroid hormone, magnesium, vitamin B12, and vitamin D levels did not differ significantly between the groups (p>0.05) (Table 4).

However, C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), leukocyte count, platelet count, neutrophil count, and sodium levels were significantly lower in the non-infectious group compared to the infectious group (p<0.05) (Table 4).

Table 3. Comparison of patients with infectious and non–infectious etiology of delirium		Delirium due to infection group (n=51)			Non–infectious delirium group (n=74)			p	
		Mean ± SD/n–%		Median	Mean ± SD/n–%		Median		
Age (year)		79.5	± 7.9	80.0	79.8	± 7.9	80.0	0.823	ᵐ
Geriatric age group	65–74	18	35.3%		19	25.7%		0.475	X²
	75–84	13	25.5%		24	32.4%			
	>84	20	39.2%		31	41.9%			
Gender	Male	24	47.1%		40	54.1%		0.442	X²
	Female	27	52.9%		34	45.9%			
Number of falls in the last 1 year		1.9	± 1.8	2.0	1.9	± 1.7	2.0	0.839	ᵐ
Fracture due to a fall	(-)	42	82.4%		58	78.4%		0.585	X²
	(+)	9	17.6%		16	21.6%			
Delirium type	Hypoactive	38	74.5%		50	67.6%		0.403	X²
	Hyperactive	13	25.5%		24	32.4%			
Mobility status	Immobile	14	27.5%		9	12.2%		**0.030**	X²
	Mobile	37	72.5%		65	87.8%			
ᵐ: Mann-Whitney U test, X²: Chi-square test, SD: Standard deviation									

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Table 4. Comparison of laboratory parameters between patients with infectious and non-infectious etiology of delirium

	Delirium due to infection group (n=51)			Non-infectious delirium group (n=74)			p	
	Mean ± SD		Median	Mean ± SD		Median		
C-reactive protein (mg/L)	187.0	± 93.2	186.0	57.5	± 64.4	35.0	**0.000**	m
Erythrocyte sedimentation rate (mm/h)	57.9	± 23.0	56.0	29.9	± 28.9	15.0	**0.000**	m
White blood cell (10^9/L)	12.9	± 5.8	14.4	8.9	± 4.0	8.3	**0.000**	m
Hemoglobin (g/dL)	11.5	± 1.6	11.5	10.8	± 2.5	11.2	0.191	m
Platelet count (10^9/L)	325.7	± 158.9	318.0	255.1	± 122.9	241.5	**0.003**	m
Neutrophil (10^9/L)	11.0	± 5.5	12.2	7.0	± 3.9	6.3	**0.000**	m
Lymphocyte (10^9/L)	1.3	± 0.8	1.4	1.3	± 0.6	1.2	0.844	m
Monocyte (10^9/L)	0.4	± 0.3	0.3	0.4	± 0.3	0.3	0.707	m
Total protein (g/dL)	6.6	± 0.6	6.6	6.2	± 1.2	6.4	0.089	m
Albumin (g/dL)	3.4	± 0.4	3.4	3.2	± 0.7	3.2	0.065	m
Total cholesterol (mg/dL)	149.9	± 43.4	144.0	152.6	± 49.5	146.0	0.890	m
Glucose (mg/dL)	137.9	± 63.6	98.0	158.1	± 148.2	124.5	0.880	m
Creatinine (mg/dL)	1.6	± 1.3	1.3	1.5	± 1.3	1.0	0.217	m
Urea (mg/dL)	66.4	± 34.0	56.0	65.7	± 49.2	44.7	0.190	m
Aspartate aminotransferase (U/L)	38.6	± 36.8	25.0	40.6	± 43.0	29.0	0.293	m
Alanine aminotransferase (U/L)	29.7	± 20.1	26.0	32.3	± 22.1	30.0	0.349	m
Sodium (mEq/L)	134.0	± 6.4	133.0	130.5	± 11.4	130.0	**0.014**	m
Potassium (mEq/L)	4.6	± 0.8	5.0	4.4	± 0.8	4.5	0.134	m
Corrected calcium (mg/dL)	8.9	± 0.8	8.9	8.9	± 0.7	8.8	0.850	m
Phosphorus (mg/dL)	3.0	± 1.1	2.7	2.9	± 0.9	2.7	0.918	m
Parathyroid hormone (pg/mL)	81.7	± 58.8	57.3	95.0	± 59.3	81.8	0.207	m
Magnesium (mg/dL)	1.8	± 0.3	1.8	1.9	± 0.3	1.8	0.704	m
Vitamin B12 (pg/mL)	383.0	± 224.9	319.0	386.7	± 304.3	300.0	0.314	m
Vitamin D (ng/mL)	18.4	± 14.2	13.8	18.6	± 16.7	13.1	0.356	m

m: Mann-Whitney U test, Min: Minimum, Max: Maximum, SD: Standard deviation

DISCUSSION

Among the patients included in our study, 64 were male (51.2%). This finding is consistent with the results of a study conducted in Egypt by Ibrahim et al.[6], which included 588 patients and reported a male prevalence of 58.5%. These data suggest that delirium may be more common in geriatric males compared to females. Similarly, in a study conducted in 2018, Trzepacz et al.[7] reported that 63.5% of 406 patients with delirium were male, further supporting the notion that delirium may occur more frequently in men.

In our research, the proportion of patients was 29.6% in both the 65-74 and 75-84 age groups, whereas it increased to 40.8% in patients aged 85 years and older. This supports the notion that the occurrence of delirium increases with advancing age. In a study conducted on 708 patients aged 85 and above, the prevalence of delirium was reported as 17% at age 85, 21%

at age 90, and 39% in individuals aged 95 years and older, with this increase being statistically significant[8]. Similarly, the medical research council cognitive function and ageing study also demonstrated that the prevalence of delirium rises with age, with the highest rates observed in individuals aged 85 and over, thereby supporting the findings of our study[9].

Infectious diseases are commonly observed among the causes of hospitalization in geriatric patients, with UTIs in particular accounting for a significant proportion of admissions. In a study conducted by Artero et al.[10], the median age of subjects admitted to the internal medicine ward due to UTIs was found to be 76 years, highlighting that UTIs are a major reason for hospitalization, especially in the geriatric population. Similarly, in our study, UTIs were identified as the most common cause of admission to the internal medicine ward in the geriatric age group, accounting for 19.2% of all hospitalizations.

With aging, one of the most significant factors affecting the quality of life in geriatric patients is falls and fall-related fractures. Each year, approximately 3 million older adults present to emergency departments in the United States due to falls[11]. About 20% of fall-related injuries are serious and result in conditions that require hospitalization and medical intervention[12]. According to the World Health Organization, around 684,000 fatal falls occur globally each year, with the majority involving adults aged 65 years and older[13]. Falls are considered a major public health issue due to their contribution to increased morbidity and mortality. The frequency of falls increases with age; it is estimated that approximately one-third of individuals over the age of 65 experience at least one fall annually, and this rate approaches 50% among those aged 80 years and older[14-16].

Falls not only result in physical injuries but also have significant psychological consequences. They can result in fear of falling, loss of self-confidence, avoidance of daily activities, decreased functionality, and social withdrawal. These outcomes not only reduce the quality of life but also increase the likelihood of recurrent falls[16]. When all these negative factors are considered together, it becomes evident that falls significantly impair the quality of life in the geriatric population, leading to reduced outdoor activity and increased susceptibility to depression[17]. In our study, patients experienced an average of 1.9 falls in the past year, and 20% sustained fractures as a result of these falls. These findings underscore the urgent need to raise public awareness about fall prevention in elderly individuals and to implement appropriate measures. In this way, healthcare systems may reduce expenditures while decreasing morbidity and mortality rates among the elderly population.

Delirium is often a complex process that arises from the interaction of multiple factors, particularly in the elderly. Predisposing and precipitating factors both play a role in the occurrence of this condition. Alcohol use, psychoactive medications, anticholinergic drugs, and polypharmacy can all trigger delirium. Other precipitating factors include surgical interventions, anesthesia, hypoxia, organ failure, untreated pain, infections, acute illnesses, and acute exacerbations of chronic diseases. In some sensitive patients, even constipation, dehydration, sleep deprivation, or urinary retention may be sufficient to trigger delirium[18].

In our research, infections were identified as the most common cause of delirium among individuals. The literature also supports this finding, with studies reporting delirium associated with UTIs and sepsis[19,20].

Delirium is also frequently observed after surgical procedures and constitutes an important cause of morbidity and mortality. While delirium occurs in approximately 10-20% of patients after major elective surgeries, its incidence can reach up to 50% following high-risk procedures. Postoperative delirium is associated with a 7-10% increase in 30-day mortality risk and prolongs the length of hospital stay by 2-3 days[21].

In our research, no significant differences were found between the infectious and non-infectious delirium groups in terms of age, sex, number of falls, presence of fall-related fractures, and delirium subtype. However, patients in the non-infectious delirium group were found to be significantly more mobile. This finding was interpreted as being related to the generalized inflammation and physical debilitation caused by infectious diseases. Given that infections were the most common cause of delirium in our study, it is crucial to promptly recognize and initiate treatment of infections in elderly patients to reduce the risk and severity of delirium episodes.

In the non-infectious delirium group, CRP, ESR, leukocyte count, platelet count, neutrophil count, and sodium levels were found to be significantly lower compared to the infectious group. This was attributed to the acute phase response commonly observed in infectious diseases, reactive thrombocytosis, and neutrophilia, especially associated with bacterial infections[21].

Sodium levels were found to be significantly lower in the non-infectious delirium group compared to the infectious group. This was thought to be due to the presence of diseases associated with hypervolemia in the non-infectious group. Conditions such as acute kidney injury, congestive heart failure, and liver failure frequently cause hypervolemic hyponatremia observed during hospital admissions[22].

Study Limitations

Among the limitations of this study is the sample size, which may affect the generalizability of the findings. The single-center design of our study was also considered an important limiting factor. Additionally, the exact hospital day on which delirium was diagnosed and the total length of hospital stay were not consistently recorded in our electronic health system during the study period. This limited our ability to analyze these parameters in detail. Furthermore, mixed-type (fluctuating) delirium was not systematically recorded during bedside evaluations, which restricted our ability to classify and analyze this specific subtype.

CONCLUSION

Delirium is a prevalent and serious clinical condition in the elderly, often presenting with acute confusion, attention deficits, and disorientation. It is frequently underdiagnosed, leading to increased morbidity and mortality. Early recognition and non-pharmacological management—such as environmental adjustments, orientation aids, and addressing underlying causes like infections or metabolic disturbances—are essential for improving outcomes. Pharmacologic treatments

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should be used cautiously and only in exceptional cases due to potential cognitive side effects in older adults. Preventive strategies, including minimizing polypharmacy, ensuring mobility, and correcting sensory deficits, play a critical role in reducing the incidence and impact of delirium. In particular, early detection and timely management of infections in the elderly are essential steps to prevent delirium and improve patient outcomes.

Ethics

Ethics Committee Approval: The Ethics Committee of University of Health Sciences Türkiye, İstanbul Training and Research Hospital granted approval for this study (decision no: 55, date: 07.03.2025). All study procedures complied with the ethical standards of the 1964 Helsinki Declaration and its later amendments.

Informed Consent: Written informed consent was obtained from all participants prior to their inclusion in the study.

Footnotes

Authorship Contributions

Concept: V.C.Ç., Y.G., E.C.G., H.Z., F.A., Design: V.C.Ç., Y.G., G.Y., M.A., H.Z., Data Collection or Processing: V.C.Ç., Y.G., E.C.G., G.Y., M.A., H.Z., Analysis or Interpretation: V.C.Ç., G.Y., F.A., Literature Search: V.C.Ç., E.C.G., M.A., F.A., Writing: V.C.Ç.

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