Arch Neurosci. 2025 July; 12(3): e154288 https://doi.org/10.5812/ans-154288

Published Online: 2025 August 15 **Research Article**

The Effect of Olanzapine Administration on the Delirium Status of Patients Admitted to the Intensive Care Unit

Aminollah Vasigh [1], Seyed Hossein Aghamiri [2,*]

[1] Department of Anesthesiology, School of Allied Medical Sciences, Ilam University of Medical Sciences, Ilam, Iran
[2] Department of Neurology, Imam Hossein Hospital, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

[*] ***Corresponding Author:*** Department of Neurology, Imam Hossein Hospital, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Email: hosseinaghamiri60@gmail.com

Received: 1 September, 2024; **Revised:** 30 May, 2025; **Accepted:** 25 June, 2025

Abstract

Background: Olanzapine is a drug effective in reducing delirium and is used in psychotic disorders, mood disorders, and acute restlessness in psychotic or bipolar patients.

Objectives: The present study aimed to determine the effect of olanzapine administration on the delirium status of patients hospitalized in the intensive care unit (ICU).

Methods: This retrospective study involved extracting information from the files of patients hospitalized in the internal ICU Department of Ilam city. Researchers obtained the necessary information by visiting the hospital and reviewing medical records. Initially, a list of all patients prescribed olanzapine and other drugs used for the treatment of delirium was obtained from the hospital's information technology unit. Subsequently, data related to the patients' files were extracted, and the effect of olanzapine on delirium recovery and its complications were compared. Data analysis was conducted using SPSS version 16, employing descriptive and analytical statistical methods.

Results: The findings indicated that most patients prescribed olanzapine were female (64.2%), admitted from other hospitals (37.3%), and hospitalized due to general medical conditions (47.8%). Additionally, in the group prescribed olanzapine, the majority of patients (85.1%) underwent whole monitoring.

Conclusions: Given the effect of olanzapine on delirium improvement and its relatively low side effects compared to other drugs, it is recommended that this medication be prescribed for patients with delirium.

Keywords: Olanzapine, Delirium, Intensive Care Unit

1. Background

The elderly population worldwide, including in Iran, is increasing, with a significant portion of Iran's population now classified as elderly or experiencing old age. It is projected that the global population will more than double by 2050 (1-3). In Iran, this increase is expected to be more pronounced than in other countries, with predictions indicating that the elderly population will rise to approximately 21.7% by 2050 (1-3). This demographic shift presents challenges for families and society, particularly concerning the hospitalization of the elderly. Many elderly patients suffer from chronic diseases such as diabetes, kidney diseases, cardiovascular diseases, and other chronic conditions, necessitating specialized hospital services, often resulting in their admission to the intensive care unit (ICU) (4-6). The ICU is a critical area of the hospital, providing specialized and high-quality care. However, prolonged ICU stays can lead to various complications, including pressure sores, drug interactions, functional decline, urinary incontinence, infections (such as those affecting the blood, respiratory, and urinary systems), falls, and psychological disorders, including delusions and hallucinations (7-9).

Distress mental disorder is a mental condition affecting thoughts, feelings, and causing significant functional impairment. Without effective treatment, it

How to Cite: Vasigh A, Aghamiri S H. The Effect of Olanzapine Administration on the Delirium Status of Patients Admitted to the Intensive Care Unit. Arch Neurosci. 2025; 12 (3): e154288. https://doi.org/10.5812/ans-154288.

can result in numerous adverse effects (10, 11). Psychosis, a side effect of hospitalization, is characterized by hallucinations or disorganized thoughts. Delusional disorders, a type of psychiatric disorder, primarily feature symptoms of schizophrenia (12-14). Initially, non-drug treatments should be employed to manage delirium (15). However, if these are ineffective, pharmacotherapy becomes a primary treatment option for psychotic disorders, although it may not achieve optimal results on its own (16, 17). Various medications are available to reduce and treat delirium, including olanzapine, chlorpromazine, haloperidol, lorazepam, risperidone, ziprasidone, and aripiprazole (15, 18, 19). Olanzapine is particularly effective in reducing delirium and is used in treating psychotic disorders, mood disorders, and acute restlessness in psychotic or bipolar patients. Its advantages include dopamine blockade, fewer extrapyramidal side effects, and efficacy in reducing delirium (19-21).

2. Objectives

Given the significance of psychological issues in patients hospitalized in the ICU, this study aimed to determine the effect of olanzapine administration on the delirium status of these patients.

3. Methods

This retrospective study, approved with the research ethics code of IR.MEDILAM.REC.1403.034, involved extracting information from the files of patients hospitalized in the internal ICU department of Ilam city. The study's inclusion criteria, based on documentation, included hospitalization in the ICU, a Glasgow Coma Scale (GCS) score greater than 5, a minimum patient age of 22 years, administration of olanzapine during ICU hospitalization, a diagnosis of delirium as per medical records, and hospitalization in the internal diseases ICU department. Pregnant patients and those directly transferred from prison to the hospital were excluded from the study. Researchers collected the necessary information by visiting the hospital and reviewing medical records. Initially, a list of all patients prescribed olanzapine and other drugs for delirium treatment was obtained from the hospital's information technology unit. After extracting general patient information, a list of patients meeting the study's inclusion criteria was compiled. Subsequently, data from the patients' files were extracted to compare the effect of olanzapine on delirium recovery and related complications.

The tool used was a researcher-developed checklist, prepared and refined using other published articles (22-25). This checklist included information such as age, gender, patient admission details (via emergency services, outpatient treatment, transfer by companions, or admission from other hospitals), patient discharge outcomes (death, referral to other hospitals, discharge, or home visits), and side effects from medication (sedation, falls, dystonic reactions, airway obstruction, weakness, extrapyramidal symptoms, decreased SPO_2, hypotension [SBP < 90 mmHg], allergy, decreased GCS, decreased consciousness). It also covered indications for medication use (inability or refusal to take oral medications, agitation) and monitoring of vital signs (incomplete monitoring, no documented monitoring, patient refusal to comply). Ethical considerations, such as maintaining confidentiality of medical records and adhering to other ethical codes, were observed. Data analysis was conducted using SPSS version 16, employing descriptive and analytical statistical methods.

4. Results

Table 1 presents the characteristics of patients receiving olanzapine compared to those not receiving the medication. The findings indicate that the majority of patients prescribed olanzapine were female (64.2%), admitted from other hospitals (37.3%), and hospitalized for general medical conditions (47.8%).

The findings in Table 2 showed that in the group for which olanzapine was prescribed, most of the patients with a rate of 85.1% had whole monitoring.

Result showed, the amount of side effects in the group receiving olanzapine was lower than other groups (Table 3).

5. Discussion

Various studies have examined the effect of olanzapine administration on patients with delirium, demonstrating the drug's effectiveness. In the study by Skrobik et al., olanzapine and haloperidol were prescribed using a randomized controlled trial (RCT) method to reduce patients' delirium, showing that both drugs effectively reduced delirium (26). Mesbahi et al. compared olanzapine and haloperidol, reporting similar efficacy for both drugs (27). The results of this study align with these findings, highlighting the positive effect of olanzapine on reducing delirium. Retrospective studies also support olanzapine's effectiveness in treating delirium. In a retrospective study by Liu et al., comparing dexmedetomidine and olanzapine, it was found that the intubation rate and duration of sanatorium stay were higher in the dexmedetomidine group, while mortality rates and

Table 1. Demographic Characteristics of Patients [a]

Variables	Receive Olanzapine (N = 67)	Received No Olanzapine (N = 71)	Total
Age	70.95 ± 9.13	58.77 ± 12.67	64.68 ± 12.63
Gender			
Male	24 (35.8)	29 (40.8)	53 (38.4)
Female	43 (64.2)	42 (59.2)	85 (61.6)
How to enter the hospital			
Call the emergency	22 (32.8)	18 (25.4)	40 (29)
Outpatient treatment	2 (3)	1 (1.4)	3 (2.2)
Transfer to the hospital by the patient's companions	18 (26.9)	18 (25.4)	36 (26.1)
Admission from other hospitals	25 (37.3)	34 (47.9)	59 (42.8)
How to leave the hospital			
Death	44 (65.7)	47 (66.2)	91 (65.9)
Sending to other hospitals	20 (29.9)	13 (18.3)	33 (23.9)
Discharge and go home	3 (4.5)	11 (15.5)	14 (10.1)
Type of disease			
General medicine	32 (47.8)	38 (53.5)	70 (50.7)
Psychiatry/suicide attempt	2 (3)	9 (12.7)	11 (8)
Neurological diseases	21 (31.3)	20 (28.2)	41 (29.7)
Heart diseases	9 (13.4)	4 (5.6)	13 (9.4)
Other	3 (4.5)	0 (0)	3 (2.2)

[a] Values are expressed as No. (%) or mean ± SD.

Table 2. Investigation of the Status of Essential Signs and Essential Treatments Related to the Prescription of Olanzapine [a]

Variables	Receive Olanzapine (N = 67)	Received No Olanzapine (N = 71)	Total
Tracking of essential signs (within 6 h)			
Whole monitoring	57 (85.1)	62 (87.3)	119 (86.2)
Incomplete tracking	6 (9)	4 (5.6)	10 (7.2)
No monitoring documented	2 (3)	4 (5.6)	6 (4.3)
Patient refuses to comply	2 (3)	1 (1.4)	3 (2.2)
Indication(s) of remedy wide variety			
Refusal/not able to take oral meds	18 (26.9)	28 (39.4)	46 (33.3)
Agitation	24 (35.8)	22 (31)	45 (32.6)
According to the doctor's opinion	23 (34.3)	20 (28.2)	44 (31.9)
Other	2 (3)	1 (1.4)	3 (2.2)

[a] Values are expressed as No. (%).

delirium recurrence did not differ between the two drugs (28). Lo et al.'s retrospective study prescribed olanzapine and midazolam for delirium, with both drugs reducing delirium; however, midazolam was associated with more respiratory side effects and sedation, suggesting olanzapine as a preferable option (22). In this study, olanzapine was associated with fewer side effects compared to other medications.

Among studies with differing results, Wang et al.'s retrospective study compared olanzapine and haloperidol, observing that both drugs reduced delirium without differences in respiratory problems or blood pressure drop. However, patient survival, somnolence, and bradycardia rates were higher in the olanzapine group (29). Wang et al. (29) examined trauma/surgical, cardiac, and cardiothoracic patients, whereas this study primarily involved patients with general medical and neurological conditions, possibly explaining the differences in complications. Conversely, a meta-analysis by Liu et al. analyzed 10 articles with 7,076 patients, 2,459 of whom received olanzapine. The

Table 3. Complications Caused by Olanzapine Administration [a]

Complications	Receive Olanzapine (N = 67)	Received No Olanzapine (N = 71)	Total
Sedation	4 (6)	6 (8.5)	10 (7.2)
Decreased consciousness	3 (4.5)	5 (7)	8 (5.8)
Dystonic reaction	2 (3)	5 (7)	7 (5.1)
Airway obstruction	3 (4.5)	6 (8.5)	9 (6.5)
Weakness	4 (6)	5 (7)	9 (6.5)
Extrapyramidal symptoms	2 (3)	3 (4.2)	5 (3.6)
Decreased SPO_2	2 (3)	6 (8.5)	8 (5.8)
Hypotension (SBP < 90 mmHg)	2 (3)	7 (9.9)	9 (6.5)
Allergy	1 (1.5)	4 (5.6)	5 (3.6)
Decreased GCS	1 (1.5)	3 (4.2)	4 (2.9)

Abbreviation: GCS, Glasgow Coma Scale.

[a] Values are expressed as No. (%).

findings indicated that olanzapine did not significantly affect the duration of delirium or its symptoms, which contrasts with this study's results. However, the rate of hypotension was lower in the olanzapine group, consistent with this study's findings (30).

5.1. Conclusions

Due to olanzapine's effectiveness in improving delirium and its relatively low side effects compared to other drugs, it is recommended for patients with delirium. Further studies in this field are also suggested.

Acknowledgements

We thank Ilam University of Medical Sciences.

Footnotes

Authors' Contribution: S. H. A. and A. V. conceived the study, performed data analysis, and wrote the manuscript. S. H. A. and A. V. collected data and wrote the manuscript. S. H. A. and A. V. interpreted the results and wrote the manuscript. S. H. A. and A. V. designed the study, wrote, and edited the manuscript.

Conflict of Interests Statement: The authors declare no conflict of interests.

Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after its publication. The data are not publicly available due to privacy.

Ethical Approval: The present study was conducted after obtaining approval by the Ethics Committee of Ilam University of Medical Sciences (IR.MEDILAM.REC.1403.034).

Funding/Support: The present study received no funding/support.

References

1. Hedayati E, Hazrati M, Momen Nasab M, Shokoohi H, Afkari F. [The Relationship Between Spiritual Well-being and Anxiety of Aged People Admitted in Coronary Care Units]. *Salmand*. 2016;**11**(3):432-9. FA. https://doi.org/10.21859/sija-1103432.
2. Mohammadian B, Mohammadi-Shahboulaghi F, Hosseini M, Arsalani N, Fallahi-Khoshknab M, Pirjani P. Factors influencing support provision to the family caregivers of elderly patients with cancer: A qualitative study. *Eur J Oncol Nurs*. 2023;**67**:102452. [PubMed ID: 37883906]. https://doi.org/10.1016/j.ejon.2023.102452.
3. Borji M, Tarjoman A. Investigating the Effect of Religious Intervention on Mental Vitality and Sense of Loneliness Among the Elderly Referring to Community Healthcare Centers. *J Relig Health*. 2020;**59**(1):163-72. [PubMed ID: 30291532]. https://doi.org/10.1007/s10943-018-0708-x.
4. Kazeminezhad B, Tarjoman A, Borji M. Relationship Between Praying and Self-Care in Elderly with Heart Failure: A Cross-Sectional Study in West of Iran. *J Relig Health*. 2020;**59**(1):19-28. [PubMed ID: 30644042]. https://doi.org/10.1007/s10943-018-00757-8.
5. Khalighi E, Ghiasi G, Karimi E, Borji M, Salimi E, Tarjoman A, et al. Assessment of Mental Health Elderly with Chronic Pain Based on Quranic Components. *J Relig Health*. 2020;**59**(6):2807-18. [PubMed ID: 31493215]. https://doi.org/10.1007/s10943-019-00908-5.
6. Guillon A, Laurent E, Godillon L, Kimmoun A, Grammatico-Guillon L. Long-term mortality of elderly patients after intensive care unit admission for COVID-19. *Intensive Care Med*. 2021;**47**(6):710-2. [PubMed ID: 33844045]. [PubMed Central ID: PMC8040757]. https://doi.org/10.1007/s00134-021-06399-x.
7. Trzepacz PT, Franco JG, Meagher D, Kishi Y, Sepulveda E, Gaviria AM, et al. Delusions and Hallucinations Are Associated With Greater Severity of Delirium. *J Acad Consult Liaison Psychiatry*. 2023;**64**(3):236-47. [PubMed ID: 36539078]. https://doi.org/10.1016/j.jaclp.2022.12.007.
8. Weissinger GM, Brooks Carthon JM, Ahmed C, Brawner BM. Experiences of Hospitalization of Patients With Psychotic Disorders

on Medical-Surgical Units: A Thematic Analysis. *J Am Psychiatr Nurses Assoc*. 2021;**27**(4):306-21. [PubMed ID: 31795792]. [PubMed Central ID: PMC9254133]. https://doi.org/10.1177/1078390319892313.

9. Balasubramanian R, Van Boeckel TP, Carmeli Y, Cosgrove S, Laxminarayan R. Global incidence in hospital-associated infections resistant to antibiotics: An analysis of point prevalence surveys from 99 countries. *PLoS Med*. 2023;**20**(6). e1004178. [PubMed ID: 37310933]. [PubMed Central ID: PMC10263350]. https://doi.org/10.1371/journal.pmed.1004178.
10. Cowan HR, Williams TF, Mittal VA, Addington J, Bearden CE, Cadenhead KS, et al. The Complex Latent Structure of Attenuated Psychotic Symptoms: Hierarchical and Bifactor Models of SIPS Symptoms Replicated in Two Large Samples at Clinical High Risk for Psychosis. *Schizophr Bull*. 2024;**50**(6):1295-309. [PubMed ID: 38728417]. [PubMed Central ID: PMC11548925]. https://doi.org/10.1093/schbul/sbae042.
11. d'Angremont E, Begemann MJH, van Laar T, Sommer IEC. Cholinesterase Inhibitors for Treatment of Psychotic Symptoms in Alzheimer Disease and Parkinson Disease: A Meta-analysis. *JAMA Neurol*. 2023;**80**(8):813-23. [PubMed ID: 37358841]. [PubMed Central ID: PMC10294019]. https://doi.org/10.1001/jamaneurol.2023.1835.
12. Sivanandy P, Leey TC, Xiang TC, Ling TC, Wey Han SA, Semilan SLA, et al. Systematic Review on Parkinson's Disease Medications, Emphasizing on Three Recently Approved Drugs to Control Parkinson's Symptoms. *Int J Environ Res Public Health*. 2021;**19**(1). [PubMed ID: 35010624]. [PubMed Central ID: PMC8744877]. https://doi.org/10.3390/ijerph19010364.
13. Peralta V, Cuesta MJ. Schneider's first-rank symptoms have neither diagnostic value for schizophrenia nor higher clinical validity than other delusions and hallucinations in psychotic disorders. *Psychol Med*. 2023;**53**(6):2708-11. [PubMed ID: 32943125]. https://doi.org/10.1017/S0033291720003293.
14. Mourgues-Codern C, Benrimoh D, Gandhi J, Farina EA, Vin R, Zamorano T, et al. Emergence and Dynamics of Delusions and Hallucinations Across Stages in Early Psychosis. *arXiv*. 2025;**Preprint**. [PubMed ID: 40020853]. [PubMed Central ID: PMC12353309]. https://doi.org/10.1016/j.biopsych.2025.02.891.
15. Egberts A, Alan H, Ziere G, Mattace-Raso FUS. Antipsychotics and Lorazepam During Delirium: Are We Harming Older Patients? A Real-Life Data Study. *Drugs Aging*. 2021;**38**(1):53-62. [PubMed ID: 33164161]. [PubMed Central ID: PMC7838136]. https://doi.org/10.1007/s40266-020-00813-7.
16. Fan P, Zeng L, Ding Y, Kofler J, Silverstein J, Krivinko J, et al. Combination of Antidepressants and Antipsychotics as A Novel Treatment Option for Psychosis in Alzheimer's Disease. *medRxiv*. 2023;**Preprint**. [PubMed ID: 36747620]. [PubMed Central ID: PMC9901071]. https://doi.org/10.1101/2023.01.24.23284970.
17. Ozer D, Dissiz M. The effect of online group based acceptance and commitment therapy on psychotic symptoms and functioning levels of individuals with early psychosis. *Schizophr Res*. 2024;**267**:55-64. [PubMed ID: 38518479]. https://doi.org/10.1016/j.schres.2024.03.018.
18. Grover S, Kumar V, Chakrabarti S. Comparative efficacy study of haloperidol, olanzapine and risperidone in delirium. *J Psychosom Res*. 2011;**71**(4):277-81. [PubMed ID: 21911107]. https://doi.org/10.1016/j.jpsychores.2011.01.019.
19. Jeffers T, Darling B, Edwards C, Vadiei N. Efficacy of Combination Haloperidol, Lorazepam, and Diphenhydramine vs. Combination Haloperidol and Lorazepam in the Treatment of Acute Agitation: A Multicenter Retrospective Cohort Study. *J Emerg Med*. 2022;**62**(4):516-23. [PubMed ID: 35287982]. https://doi.org/10.1016/j.jemermed.2022.01.009.
20. Kochen SA, Hakkers CS, van Gorp F, de Lange DW, Haas LEM. Olanzapine postinjection delirium/sedation syndrome after long-acting olanzapine depot injection presenting to the emergency department: practical guidelines for diagnosis and management. *Emerg Med J*. 2024;**41**(12):759-63. [PubMed ID: 39013637]. https://doi.org/10.1136/emermed-2024-213972.
21. Jain R, Arun P, Sidana A, Sachdev A. Comparison of efficacy of haloperidol and olanzapine in the treatment of delirium. *Indian J Psychiatry*. 2017;**59**(4):451-6. [PubMed ID: 29497187]. [PubMed Central ID: PMC5806324]. https://doi.org/10.4103/psychiatry.IndianJPsychiatry_59_17.
22. Lo WL, Mok KL, Poon YY. A retrospective study on the safety and effectiveness of olanzapine versus midazolam for pre-hospital management of excited delirium syndrome. *Hong Kong J Emerg Med*. 2021;**29**(5):281-8. https://doi.org/10.1177/10249079211020868.
23. Duong S, Yeung KT, Chang F. Intramuscular Olanzapine in the Management of Behavioral and Psychological Symptoms in Hospitalized Older Adults: A Retrospective Descriptive Study. *J Aging Res*. 2015;**2015**:570410. [PubMed ID: 26090227]. [PubMed Central ID: PMC4458274]. https://doi.org/10.1155/2015/570410.
24. Grover S, Dua D, Sahoo S, Chakrabarti S, Avasthi A. Effectiveness of melatonin in the management of delirium: A retrospective study. *J Mental Health Hum Behav*. 2019;**24**(2). https://doi.org/10.4103/jmhhb.jmhhb_56_19.
25. Weaver CB, Kane-Gill SL, Gunn SR, Kirisci L, Smithburger PL. A retrospective analysis of the effectiveness of antipsychotics in the treatment of ICU delirium. *J Crit Care*. 2017;**41**:234-9. [PubMed ID: 28595082]. https://doi.org/10.1016/j.jcrc.2017.05.034.
26. Skrobik YK, Bergeron N, Dumont M, Gottfried SB. Olanzapine vs haloperidol: treating delirium in a critical care setting. *Intensive Care Med*. 2004;**30**(3):444-9. [PubMed ID: 14685663]. https://doi.org/10.1007/s00134-003-2117-0.
27. Mesbahi J, Shadnia S, Hassanian-Moghaddam H, Zamani N, Erfan Talab Evini P, Hazegh Fetratjoo D, et al. Delirium treatment in intoxicated patients in ICU: A randomized, double-blind clinical trial. *J Emerg Practice and Trauma*. 2020;**7**(2):93-6. https://doi.org/10.34172/jept.2020.41.
28. Liu S, Zhao R, Yang R, Zhao H, Ji C, Duan M, et al. Are dexmedetomidine and olanzapine suitable to control delirium in critically ill elderly patients? A retrospective cohort study. *Biomed Pharmacother*. 2021;**139**:111617. [PubMed ID: 33915500]. https://doi.org/10.1016/j.biopha.2021.111617.
29. Wang M, Yankama TT, Abdallah GT, Eche IJ, Knoph KN, Wong A, et al. A Retrospective Comparison of the Effectiveness and Safety of Intravenous Olanzapine Versus Intravenous Haloperidol for Agitation in Adult Intensive Care Unit Patients. *J Intensive Care Med*. 2022;**37**(2):222-30. [PubMed ID: 33426981]. https://doi.org/10.1177/0885066620984450.
30. Liu SB, Liu S, Gao K, Wu GZ, Zu G, Jie Liu J. Olanzapine for the treatment of ICU delirium: a systematic review and meta-analysis. *Ther Adv Psychopharmacol*. 2023;**13**:20451253231152100. [PubMed ID: 36845642]. [PubMed Central ID: PMC9944192]. https://doi.org/10.1177/20451253231152113.