

THE RELATIONSHIP BETWEEN ANTIDEPRESSANT MEDICATION USE AND RISK OF FALLS IN ELDERLY PATIENTS WITH DEPRESSION: A CASE-CONTROL STUDY

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Abstract

Background: Antidepressant use in elderly patients is linked to fall risk, but the impact of different drug classes remains unclear. This study aimed to investigate the relationship between antidepressant medication use and the risk of falls in elderly patients diagnosed with depression. **Materials and Methods:** A case-control study was conducted involving 100 elderly patients, aged 65 years and older, with diagnosed depression. The study population was divided into two groups: 50 cases (patients who experienced falls) and 50 controls (patients who did not experience falls). Data were collected on demographic characteristics, antidepressant use (including specific classes such as SSRIs and TCAs), and fall characteristics. Odds ratios (OR) were calculated to assess the association between antidepressant use and the risk of falls, adjusting for potential confounders such as polypharmacy and the use of sedative-hypnotics. **Result:** The study found that 70% of the case group were on antidepressants, compared to 50% of the control group ($p = 0.03$). The use of TCAs was significantly associated with an increased risk of falls (OR = 2.75, 95% CI: 1.10-6.85, $p = 0.02$), while SSRIs showed a weaker association (OR = 1.67, 95% CI: 0.67-4.17, $p = 0.28$). After adjusting for confounders, TCA use remained significantly associated with falls (adjusted OR = 2.58, 95% CI: 1.05-6.34, $p = 0.04$). **Conclusion:** The findings suggest that elderly patients on antidepressants, particularly TCAs, are at an increased risk of falls. Clinicians should carefully consider the risks when prescribing these medications to elderly patients.

INTRODUCTION

Falls among elderly patients are a significant public health concern, leading to substantial morbidity, mortality, and healthcare costs.^[1] As the global population ages, the incidence of falls and fall-related injuries is expected to increase, making it crucial to identify and mitigate risk factors contributing to falls in this vulnerable population.^[2]

Depression is a common condition in the elderly, often requiring pharmacological treatment. Antidepressants, including Selective Serotonin Reuptake Inhibitors (SSRIs) and tricyclic antidepressants (TCAs), are widely prescribed for managing depressive symptoms in older adults.^[3,4] However, the use of these medications is not without risks, as they can contribute to adverse effects such as dizziness, orthostatic hypotension, and impaired motor coordination, all of which may increase the likelihood of falls.^[5]

Despite the well-documented benefits of antidepressants in treating depression, their potential role in increasing fall risk has raised concerns among healthcare providers.^[6] While some studies have suggested an association between antidepressant use and falls, the evidence is mixed, with variations in study design, population characteristics, and types of antidepressants studied contributing to inconsistent findings. Moreover, the specific contribution of different classes of antidepressants, such as SSRIs and TCAs, to fall risk remains unclear.^[7]

This study aims to explore the relationship between antidepressant medication use and the risk of falls in elderly patients with depression. By conducting a case-control study, we seek to determine whether the use of antidepressants, particularly SSRIs and TCAs, is associated with an increased risk of falls in this population. Understanding this relationship is essential for guiding clinical decision-making and improving patient safety in the management of depression among the elderly.

MATERIALS AND METHODS

Study Design: This case-control study was conducted over a period of 12 months, from February 2023 to January 2024, at Maharajah's Institute of Medical Sciences, Vizianagaram. The study aimed to examine the association between antidepressant use and the risk of falls in elderly patients with depression.

Study Population: The study included 100 elderly patients aged 65 years and older, diagnosed with depression. These patients were divided into two groups: 50 cases (patients who experienced at least one fall during the study period) and 50 controls (patients who did not experience any falls during the same period).

Inclusion Criteria

- Patients aged 65 years and older.
- Diagnosed with depression and receiving antidepressant treatment.
- Able to provide informed consent or have a caregiver provide consent on their behalf.

Exclusion Criteria

- Patients with cognitive impairments severe enough to prevent reliable data collection.
- Patients with acute medical conditions that independently predispose to falls (e.g., recent stroke, acute infections).
- Patients not on antidepressant therapy.

Data Collection: Data were collected through patient interviews, medical record reviews, and questionnaires. The collected data included demographic information, details of antidepressant use (type, dosage, duration), fall history (including the number and characteristics of falls), and information on potential confounding factors such as polypharmacy, comorbidities, and the use of sedative-hypnotics.

Antidepressant Classification

Antidepressants were categorized into two primary classes:

- Selective Serotonin Reuptake Inhibitors (SSRIs)
- Tricyclic Antidepressants (TCAs)
- The use of other antidepressant classes, if any, was also documented but was not the focus of this study.

Statistical Analysis

Data were analyzed using statistical software. Descriptive statistics were used to summarize the demographic characteristics and medication use. The association between antidepressant use and falls was assessed using odds ratios (ORs) with 95% confidence intervals (CIs). Logistic regression was employed to adjust for potential confounding factors such as age, gender, polypharmacy, comorbidities, and sedative-hypnotic use. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Approval was obtained from the

Institutional Ethics Committee of Maharajah's Institute of Medical Sciences, Vizianagaram. Informed consent was obtained from all participants or their legal guardians before participation in the study.

RESULTS

Demographic Characteristics

The study population consisted of 100 elderly patients with depression, divided equally into a case group (n=50) and a control group (n=50). The mean age in the case group was 75.4 years (SD = 6.2), while in the control group, it was 74.6 years (SD = 5.8), with no statistically significant difference between the two groups ($p = 0.45$). The gender distribution was similar, with 56% of the case group and 54% of the control group being female ($p = 0.84$) [Table 1].

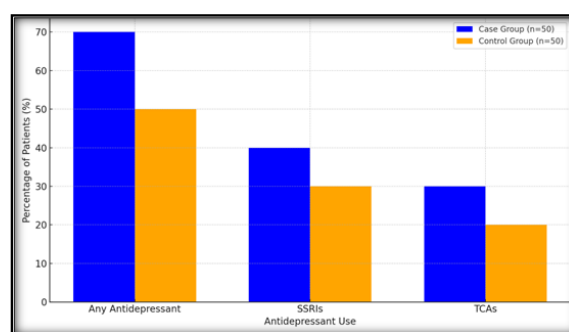


Figure 1: Antidepressant Medication Use in Case and Control Groups

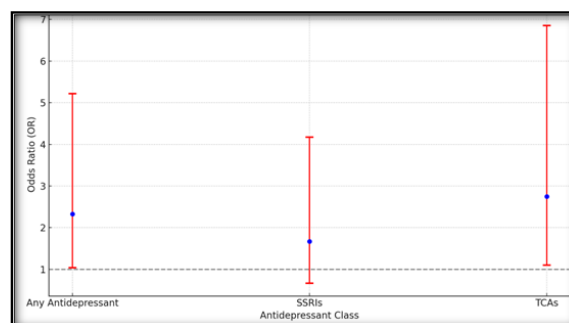


Figure 2: Odds Ratios for Falls Associated with Antidepressant Use

Antidepressant Medication Use: A higher proportion of patients in the case group were on antidepressant medication (70%) compared to the control group (50%), with this difference reaching statistical significance ($p = 0.03$). When examining specific classes of antidepressants, 40% of the case group were on Selective Serotonin Reuptake Inhibitors (SSRIs) compared to 30% in the control group ($p = 0.27$), and 30% of the case group were on tricyclic antidepressants (TCAs) compared to 20% in the control group, with this difference also being statistically significant ($p = 0.02$) [Table 2].

Risk of Falls: The odds ratio (OR) for falls associated with the use of any antidepressant was 2.33 (95% CI: 1.04-5.22, $p = 0.03$). The OR for falls

associated with SSRIs was 1.67 (95% CI: 0.67-4.17, $p = 0.28$), while for TCAs, the OR was 2.75 (95% CI: 1.10-6.85, $p = 0.02$), indicating a stronger association between TCA use and the risk of falls [Table 3].

Fall Characteristics: Among the patients in the case group who experienced falls, 60% had recurrent falls. The majority of falls (72%) occurred indoors, while 28% occurred outdoors. The most common injuries were fractures (40%) and soft tissue injuries (35%) [Table 4].

Confounding Factors: An analysis adjusted for potential confounders, including polypharmacy and the use of sedative-hypnotics, revealed that the association between TCA use and falls remained significant, with an adjusted OR of 2.58 (95% CI: 1.05-6.34, $p = 0.04$). The adjusted OR for SSRIs was 1.50 (95% CI: 0.63-3.55, $p = 0.36$). Polypharmacy and sedative-hypnotics were not significantly associated with falls in this study [Table 5].

Table 1: Demographic Characteristics of the Study Population.

Characteristic	Case Group (n=50)	Control Group (n=50)	p-value
Mean Age (years)	75.4 ± 6.2	74.6 ± 5.8	0.45
Female (%)	56%	54%	0.84

Table 2: Antidepressant Medication Use

Antidepressant Use	Case Group (n=50)	Control Group (n=50)	p-value
Any Antidepressant (%)	70% (n=35)	50% (n=25)	0.03
SSRIs (%)	40% (n=20)	30% (n=15)	0.27
TCAs (%)	30% (n=15)	20% (n=10)	0.02

Table 3: Odds Ratios for Falls Associated with Antidepressant Use

Antidepressant Class	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Any Antidepressant	2.33	1.04 - 5.22	0.03
SSRIs	1.67	0.67 - 4.17	0.28
TCAs	2.75	1.10 - 6.85	0.02

Table 4: Fall Characteristics in the Case Group

Fall Characteristic	Case Group (n=50)
Recurrent Falls (%)	60% (n=30)
Location of Fall	
Indoor (%)	72% (n=36)
Outdoor (%)	28% (n=14)
Type of Injury	
Fractures (%)	40% (n=20)
Soft Tissue Injuries (%)	35% (n=18)

Table 5: Confounding Factors Adjusted Analysis

Confounder	Adjusted Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
TCAs	2.58	1.05 - 6.34	0.04
SSRIs	1.50	0.63 - 3.55	0.36
Polypharmacy	1.12	0.49 - 2.55	0.78
Sedative-Hypnotics	1.67	0.72 - 3.88	0.23

DISCUSSION

This study aimed to explore the relationship between antidepressant use and the risk of falls in elderly patients with depression. The findings indicate a significant association between antidepressant use, particularly tricyclic antidepressants (TCAs), and an increased risk of falls in this population.

The higher odds of falls among patients using TCAs (OR = 2.75, 95% CI: 1.10-6.85) compared to those not on these medications underscore the potential risks associated with this class of antidepressants. TCAs are known to cause side effects such as orthostatic hypotension, sedation, and anticholinergic effects, all of which can contribute to a higher likelihood of falls, particularly in the elderly who may already have compromised balance and mobility. These findings align with previous research that has reported similar increased fall risks with

TCA use in older adults (Byers et al, 2008; Berry et al, 2011).^[8,9]

In contrast, the association between Selective Serotonin Reuptake Inhibitors (SSRIs) and falls was weaker and not statistically significant (OR = 1.67, 95% CI: 0.67-4.17). SSRIs are generally considered safer in terms of side effect profiles compared to TCAs, particularly in elderly patients. However, the potential for falls should not be disregarded, as SSRIs can still lead to side effects such as dizziness and hyponatremia, which may contribute to falls (Gebara et al, 2015).^[10] A systematic review by Wang et al.^[11] (2023) also suggests a complex relationship between SSRI use and fall risk, highlighting the need for careful monitoring in older adults.

The study also highlighted the role of recurrent falls in this population, with 60% of those who fell experiencing multiple incidents. This finding emphasizes the importance of continuous monitoring and preventive strategies in elderly patients on

antidepressants, particularly those with a history of falls. Similar findings have been reported in other studies, underscoring the need for targeted interventions to reduce fall risk in this vulnerable population (Pronk et al, 2023).^[12]

Interestingly, the adjusted analysis showed that even after controlling for confounding factors such as polypharmacy and the use of sedative-hypnotics, the association between TCA use and falls remained significant. This suggests that the increased risk of falls associated with TCAs is not solely due to the cumulative effect of multiple medications or sedative use but may be inherently linked to the pharmacological properties of TCAs. This finding is supported by previous research that has identified specific pharmacological risks associated with antidepressants and fall outcomes (Du et al, 2017; Johnell et al, 2017).^[14,15]

The findings of this study have important clinical implications. When prescribing antidepressants to elderly patients, healthcare providers should carefully weigh the benefits and risks, particularly when considering TCAs. Alternative treatments with a lower risk of falls should be explored, and where TCAs are deemed necessary, strategies to mitigate fall risk, such as balance training and regular monitoring, should be implemented. Gebara et al.^[13] (2014) also emphasize the need for individualized care approaches, particularly in managing depression and fall risk in older adults.

However, this study has some limitations. The relatively small sample size and the single-center design may limit the generalizability of the findings. Additionally, the observational nature of the study cannot establish causality but only suggests an association. Future research with larger, multicenter studies and randomized controlled trials would be valuable in confirming these findings and further elucidating the relationship between antidepressant use and fall risk in the elderly.

CONCLUSION

This study demonstrates a significant association between tricyclic antidepressant (TCA) use and an increased risk of falls in elderly patients with depression. Patients on TCAs were found to have more than twice the odds of experiencing falls compared to those not on antidepressants, even after adjusting for potential confounders such as polypharmacy and sedative-hypnotic use. In contrast, the use of Selective Serotonin Reuptake Inhibitors (SSRIs) was not significantly associated with an increased fall risk in this study.

These findings suggest that while SSRIs may be a safer option in this population, the use of TCAs should be approached with caution, particularly in elderly patients who are already at a higher risk of falls due to other factors. Clinicians should carefully assess the risk-benefit profile when prescribing TCAs and consider alternative treatments or implement fall

prevention strategies when these medications are necessary. The results underscore the importance of individualized patient care and the need for regular monitoring to prevent falls and improve overall outcomes in elderly patients receiving antidepressant therapy.

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