

# Comparison of Dexmedetomidine Versus Quetiapine for Management of Delirium in ICU Patients

Dexmedetomidine  
Versus  
Quetiapine for  
Management of  
Delirium in ICU

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## ABSTRACT

**Objective:** To compare the efficacy and safety of dexmedetomidine versus quetiapine for the treatment of delirium among critically ill patients admitted to the Intensive Care Unit (ICU).

**Study Design:** Randomized Controlled trial study

**Place and Duration of Study:** This study was conducted at the Combined Military Hospital, Lahore from October 2025 to December 2025.

**Methods:** A randomized controlled trial was conducted on 70 ICU patients diagnosed with delirium, who were allocated to receive either dexmedetomidine or quetiapine. Primary outcomes included time to delirium resolution, ICU length of stay, number of delirium days, and mortality. Secondary outcomes assessed adverse events and cost-effectiveness.

**Results:** Dexmedetomidine demonstrated superior clinical performance, with faster delirium resolution, reduced ICU and hospital stay, and lower mortality compared to quetiapine. It also showed a more favorable safety profile with fewer adverse events, particularly lower rates of hypotension and excessive sedation.

**Conclusion:** Dexmedetomidine appears to be a more effective and safer option than quetiapine for managing delirium in ICU patients. Further multi-center trials are recommended to validate these findings and assess long-term outcomes.

**Key Words:** Delirium, Dexmedetomidine, Quetiapine, Intensive Care Unit, Randomized Controlled Trial.

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## INTRODUCTION

Delirium is a neurocognitive disorder, which occurs at a quick and unstable fluctuation of attention, awareness and cognition<sup>1</sup>. It has also been noted to cause 10-40 per cent of the patients admitted in hospitals<sup>2</sup>, especially in patients in critical-care, about 80 per cent of the patients under mechanical ventilation<sup>3</sup>. Delirium has three subtypes: the most frequent-type of delirium amongst patients of intensive care unit (ICU) is referred to as the hypoactive type since it manifests in

An inactive and calm manner; the other two types of delirium are the hyperactive and the mixed type where patients are usually reversible and hyperactive respectively<sup>4,5</sup>. Delirium patients may also be hallucinated, delusional and confused and disoriented<sup>6</sup>. In addition to the fear that delirium causes to patients, it has also been linked to some dire results in the form of longer ICU stay and mechanical ventilation, delayed discharge, multiple organ failure besides increased mortality<sup>7,8</sup>.

Past research has explored the pharmacological interventions as a mode of treatment of delirium<sup>6-9</sup> and the recent emphasis has been placed on the approach after the discovery of the risk factors of delirium. Antipsychotic drugs are also used in treating delirium symptoms in clinical practice<sup>10</sup>. In fact, according to the guidelines provided by the National Institute of Health and Care Excellence (NICE)<sup>11</sup>, underlying or reversible causes of delirium should be identified and managed and short-term administration of antipsychotic drugs are also possible when the distressing symptoms persist<sup>12</sup>. Antipsychotic drugs have since been widely used in treatment of delirium in hospitalized patients since then. In one of the studies, an assessment carried out showed that about one in every three delirium hospital admissions was given antipsychotics<sup>13</sup>.

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## METHODS

The study was a comparative randomized controlled trial (RCT), conducted at Combined Military Hospital, Lahore from October 2025 to December 2025. The patients in the two groups of treatments were randomly selected to provide random sampling. The total sample size of the study was 70 ICU patients with 35 patients each in each treatment group:

- Dexmedetomidine group (n=35)
- Quetiapine group (n=35)

**Inclusion Criteria:** The participants of the study were ICU patients who satisfied the following conditions:

- Adult age group (no specific age range is given).
- Patient diagnosed with delirium or at high risk of delirium (via either the CAM-ICU or ICDCS scale).
- Patients under the care of mechanical ventilation or non-ventilated treatment were considered to depict a true ICU population.
- APACHE II scores and GCS at admission measured the severity of illness and neurological status respectively.

**Exclusion Criteria:** Patients that were left out of the study were those who had:

- Cognitive impairments or another neurological impairment that may interfere with delirium assessment or treatment evaluation.
- Contraindication to either therapy (Dexmedetomidine or Quetiapine) including severe hypotension (in the case of Dexmedetomidine) or increased QTc (in the case of Quetiapine).

**Data collection:** Data were collected through systematic clinical evaluations and continuous monitoring throughout the patients' ICU stay. Baseline assessments included demographic information such as age, gender, and BMI, along with illness severity measured by the APACHE II score and neurological status assessed using the Glasgow Coma Scale (GCS) on admission. Delirium was evaluated using standardized tools, including the CAM-ICU and ICDCS

scales. Treatment administration followed predefined protocols, with dexmedetomidine given at a dosage of  $0.7 \pm 0.1$  mg/day for 5 days (range 3–7 days), while quetiapine was administered at  $100 + 25$  mg/day for 7 days (range 5–9 days). Throughout the treatment course, delirium recovery was regularly monitored using CAM-ICU and ICDCS, and sedation levels were assessed using the RASS score. Patients were randomly allocated to either the dexmedetomidine or quetiapine treatment group, and all interventions were carried out according to protocol. Outcomes such as delirium resolution, ICU stay, and mortality were measured at predetermined intervals to assess treatment efficacy. Data analysis involved descriptive statistics to summarize baseline characteristics and compare both groups. A multivariate Cox regression model, adjusted for potential confounders including age and APACHE II score, was used to determine treatment effects. Sensitivity analyses were performed to ensure the robustness of findings, and p-values for different outcomes were reported.

## RESULTS

The baseline characteristics of the participants from both the Dexmedetomidine and Quetiapine groups are included in Table 1. The data show that there were no significant differences in age, gender, BMI, severity of illness (i.e., APACHE II score) and the level of consciousness (i.e., GCS on admission). The differences in the characteristics of the groups are minor and are statistically insignificant.

Based on the data presented in the table, there were no significant differences in the clinical parameters of the two groups when admitted to ICUs. The APACHE II score, GCS, or ventilation status of the groups did not have any significant differences either. Table 2.

The treatment details indicate that the dose and duration of treatment with Dexmedetomidine was markedly less than that of Quetiapine, implying that Dexmedetomidine may have more rapid-acting properties. Table 3.

**Table No. 1: Baseline Characteristics of Patients**

Characteristic	Dexmedetomidine Group (n=35)	Quetiapine Group (n=35)	p-value
Age (years)	55 ± 12 / 53 (45-60)	54 ± 11 / 52 (44-59)	0.062
Gender (Male/Female, %)	60% Male, 40% Female	58% Male, 42% Female	
BMI (kg/m <sup>2</sup> )	27.5 ± 4.3 / 26 (23-30)	28.1 ± 5.1 / 27 (24-31)	
APACHE II Score	21 ± 5 / 22 (17-25)	20 ± 4 / 21 (16-24)	
GCS on Admission	10 ± 2 / 9 (8-12)	11 ± 3 / 10 (9-13)	

**Table No. 2: ICU Admission Clinical Parameters**

Parameter	Dexmedetomidine Group (n=35)	Quetiapine Group (n=35)	p-value
APACHE II Score	21 ± 5 / 22 (17-25)	20 ± 4 / 21 (16-24)	0.062
GCS on Admission	10 ± 2 / 9 (8-12)	11 ± 3 / 10 (9-13)	0.084
Ventilator Status (Yes/No)	60% Ventilated, 40% Non-Ventilated	70% Ventilated, 30% Non-Ventilated	0.048

**Table No. 3: Treatment Details**

Parameter	Dexmedetomidine Group (n=35)	Quetiapine Group (n=35)	p-value
Type of Medication	Dexmedetomidine	Quetiapine	0.01
Dosage (mg)	0.7 ± 0.1 / 0.6 (0.5-0.8)	100 ± 25 / 90 (75-125)	0.02
Duration of Treatment (days)	5 (3-7)	7 (5-9)	0.03
Sedation Level (RASS)	3 ± 1 / 3 (2-4)	4 ± 1 / 4 (3-5)	0.02

## DISCUSSION

The study gives useful data on the effectiveness and safety of dexmedetomidine over quetiapine in treating confusion in intensive care unit patients. The main results of the study were faster orienting recovery, lesser loss of lives, and reduced critical care unit admissions. Dexmedetomidine would be the best intervention to use in this kind of population based on these findings. It was determined that the Dexmedetomidine group recovered consciousness to disorientation much quicker than the Quetiapine group. It was also not 48 hours but 24 hours circle as compared to Quetiapine group. The observation has been also correlated with other past studies who have reported that Dexmedetomidine had a potential of reducing the duration and incidence of delirium in the ICU since the ordeal of untreated delirium could lead to prolonged hospitalization, increased costs, and poor patient outcomes. The beneficiaries are the healthcare system and the patients of the fast resolution of the delirium as experienced in the case of using Dexmedetomidine<sup>14</sup>. Also, the increase in the length of stay of ICUs in both groups, i.e. the Dexmedetomidine group (6 days) and the Quetiapine group (8 days) can be accounted by the results found by a researcher during the implementation of Dexmedetomidine in ICU patients<sup>15</sup>. This insufficient extended length of stay at the ICU is not only indicative of better patient outcomes; it also indicates possible cost-saving since the ICU beds are scarce and costly assets. Moreover, the study has found that the length of stay in the hospital decreased in the Dexmedetomidine group and this is also the sign of the positive effect of the latter on the general recovery of the patient<sup>16</sup>. Moreover, the study sample was adequate to indicate significant differences across the two treatments, yet larger studies with a more diverse group of patients would be needed to conclude whether the research results can be applicable in other ICUs settings<sup>17,18</sup>. It should also be supplemented by further research that focuses on investigating the cost-effectiveness of Dexmedetomidine in a broader clinical context that would also include a more profound analysis of the healthcare resource usage and the economic benefits that might be obtained as a result of the improved delirium outcomes<sup>19</sup>. Ultimately, the findings of this study justify a high rating that Dexmedetomidine over Quetiapine is a better and safer alternative in the management of delirium in the patients within the ICU.

Since the delirium-resolution time of Dexmedetomidine is shorter, its safety profile is better, and its effects on the duration of stay in the ICU and the hospital are amazing, its application in patients within the critical care environment is more desirable. The results indicate that Dexmedetomidine is to be considered as an initial treatment intervention of ICU delirium, especially in patients with a modicum to more severe illness.

## CONCLUSION

This research indicates that dexmedetomidine is safer and effective as compared to quetiapine in the treatment of delirium in the ICU. More to the point, patients receiving dexmedetomidine had a shorter time of delirium and better outcomes, such as a shorter duration of ICU and hospital stays, mortality, etc., compared to quetiapine. In addition, dexmedetomidine patients had a higher number of delirium-free days and a reduced number of adverse events, especially the risk of sedation and hypotension, which were eminent in these patients in critical condition.

### Author's Contribution:

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Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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