

Optimization of Delirium Care in Adult Patients with Cancer: A Comprehensive and Integrative Review of Efficacy and Patient Outcomes

Onyekachi Darlington Bennette Ojiaku ¹, Pius Chukwudi Duru ¹, Aloysius Obinna Ikwuka ^{2,*} , Francis Chigozie Udeh ² 

¹ Department of Public Health, University of Wolverhampton, Wolverhampton, England, United Kingdom

² College of Medicine and Health Sciences, American International University West Africa, Banjul, The Gambia

* Correspondence: Aloysius Obinna Ikwuka (aloyssiussweet@yahoo.com)

Abstract: Delirium is a major complication most commonly observed in patients with advanced cancer. However, despite its prevalence, the early diagnosis, management, and prevention of this condition have not seen significant progress. Aim of this research is to provide insights into the prevalence of delirium, the optimization of interventions for managing delirium symptoms, their effectiveness and the impact of underlying factors on the reversibility of delirium in advanced cancer patients receiving palliative care. The review involved systematic searches of relevant databases including MEDLINE, CINAHL, ProQuest Nursing and Allied Health, and PsychInfo using refined search terms. Eight publications out of 614 studies originally searched were selected and critically reviewed. Their quality was assessed using Joanna Briggs Institute's Critical Appraisal Tool for Case Series. Data abstraction and content analysis were performed to synthesize the findings. Delirium is prevalent among advanced cancer patients in palliative care, with rates ranging from 10.3% to 24.1%. Pharmacotherapy and non-pharmacological interventions showed effectiveness in reducing delirium symptoms. Delirium was found to be reversible through palliative care interventions, antipsychotic medications, and exercise therapy. Effective delirium management is crucial in improving the quality of life of cancer patients. This review emphasizes the importance of subtype-specific treatments, standardized guidelines, and long-term follow-up studies. Implementing evidence-based individualized approaches to delirium management can optimize treatment efficacy and clinical outcomes in patients as well as improve the quality of care. Tailored interventions, standardized protocols, and further research are hereby recommended.

Keywords: Optimization, Delirium Care, Cancer Patients, Comprehensive Review, Integrative Review, Efficacy, Patient Outcomes

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1. Introduction

Delirium is a temporary state of confusion characterized by a lack of focus and impairment of cognitive function throughout the brain. Delirium is a neuropsychiatric disorder that is commonly observed in patients with cancer, and its prevalence is considerably higher in those approaching the end of life [1]. The incidence of delirium is reported to increase exponentially as the patient's condition deteriorates [1]. This highlights the significance of delirium as a common complication in end-of-life care and the importance of early identification and management of delirium in patients with cancer, particularly those in the terminal phase, to improve their quality of life.

In patients with cancer, delirium is a multi-factorial condition that can be triggered by various physiological disturbances, such as infections, organ failure, and medication

side effects [44, 47]. The development of delirium can occur through the direct effects of cancer on the central nervous system or as a result of its treatments, such as chemotherapy, immunotherapy agents, opioids, antiemetics, and benzodiazepines [44, 47]. Notably, the use of opioids and cognitive, liver, or renal impairment are significant risk factors for delirium in patients with advanced cancer [1, 8]. Linked with the induction of oxidative stress are major free radicals. Among these major free radicals, superoxide anion, hydroxyl radical, and hydroperoxyl radical are of physiological significance. Non-radical of physiological significance is hydrogen peroxide [2, 3, 12, 28, 37, 38, 50, 51]. Patients with Vitamin K deficiency are prone to different degrees of bleeding which can lead to anemia [27].

Despite the various underlying causes of delirium, its symptoms are typically consistent, with core symptoms characterized by disturbances in attention, cognitive function, and consciousness [44, 47]. The manifestation of these symptoms may result from a final common pathway involving the prefrontal cortex, posterior parietal cortex, and anteromedial thalamus, and an imbalance in acetylcholine and dopamine neurotransmitters [1, 8]. Metabolic (or biochemical) genetics involves the diagnosis and management of inborn errors of metabolism in which patients have enzymatic deficiencies which disturb biochemical pathways involved in the metabolism of carbohydrates, amino acids, and lipids [29].

Delirium is commonly classified into three subtypes based on the level of arousal and psychomotor behavior, namely hyperactive, hypoactive, and mixed subtype, in clinical practice [36]. The incidence of delirium in cancer patients, particularly those in the end-of-life phase, is a major concern due to its detrimental effects on patients' quality of life and their ability to tolerate cancer treatment.

Pharmacological management of delirium in cancer patients involves the use of psychotropic medications, including antipsychotics, cholinesterase inhibitors, and alpha-2 agonists. These drugs have been investigated for the management of delirium symptoms in cancer patients [6]. Antipsychotics, a class of medications typically used to treat schizophrenia, bipolar disorder, and other mood disorders, are commonly utilized for the management of delirium symptoms in cancer patients. They are classified because of their effects on dopamine and serotonin receptor subtypes into typical (conventional or first-generation) subtype which can sometimes cause extrapyramidal adverse effects [46], and atypical (second-generation) subtype which has been linked to weight gain and metabolic syndrome with a lower risk of extrapyramidal adverse effects [9].

Apart from antipsychotics, cholinesterase inhibitors which increase the availability of acetylcholine in the brain, and alpha-2 agonists which reduce norepinephrine release in the central nervous system, have been studied for the management of delirium symptoms in cancer patients. Nevertheless, evidence supporting their efficacy is limited, and they are not recommended as first-line agents for the treatment of delirium [7, 14].

Palliative care is a patient-centred approach that aims to address the physical, emotional, and spiritual needs of patients with advanced cancer [4]. This approach to care involves the use of pharmacological and non-pharmacological interventions to manage symptoms with the ultimate goal of improving the patient's quality of life. While both palliative care and pharmacotherapy aim to improve the quality of life of patients with advanced cancer, the former is primarily aimed at alleviating the symptoms and improving the quality of life, while the latter is primarily focused on ameliorating cancer itself. However, it is important to note that palliative care can be used in conjunction with pharmacotherapy to manage symptoms and improve overall well-being [49]. This study therefore aims to provide insights into the prevalence of delirium, effective interventions, and the impact of underlying factors on the reversibility of delirium in advanced cancer patients.

2. Methodology

2.1. Search Strategy

This study uses a comprehensive and integrative review approach which is more flexible because it incorporates studies with various methodologies, unlike the systematic review approach that primarily prioritizes randomized controlled trials (RCTs) and follows specific pre-determined methodologies. By including a broader range of study designs, such as qualitative research, case studies, and observational studies, integrative reviews can provide a more comprehensive understanding of the effectiveness of interventions for managing and reducing delirium in cancer patients receiving palliative care.

The model of Population, Exposure, and Outcome, which explores relationships and associations, was used to identify keywords used in the databases to retrieve relevant studies. The PEO elements as illustrated in [Table 1](#) were used as a framework to develop the title, with a specific focus on studies investigating the efficacy of interventions to alleviate delirium in cancer patients.

Table 1. The search terms used in finding relevant studies

| Category | Search terms | Databases |
|------------|--|--------------------------------------|
| Population | (cancer OR oncology OR terminally ill OR palliative care OR neoplasm*) AND (patient* OR elder*) | MEDLINE, CINAHL, ProQuest, PsychInfo |
| Exposure | (delirium OR therapeutic interventions OR management OR pharmacological OR non-pharmacological OR multidisciplinary OR supportive OR symptom management OR family involvement) (efficacy OR treatment outcomes OR evidence-based | MEDLINE, CINAHL, ProQuest, PsychInfo |
| Outcome | recommendations OR quality of life OR symptom control OR duration OR mortality OR healthcare costs OR patient satisfaction) | MEDLINE, CINAHL, ProQuest, PsychInfo |
| Wildcard | deliri* AND Palliat* | MEDLINE, CINAHL, ProQuest, PsychInf |

2.2. Data Sources

The information for this paper was sourced from the following databases: MEDLINE, CINAHL, ProQuest Nursing and Allied Health, and PsychInfo. These databases were selected due to their strong emphasis on the fields of medicine, nursing, and psychology.

2.3. Search Methods

Search terms were influenced by the research topic. These terms including cancer, terminally ill, palliative care, neoplasm, patient, elder, delirium, therapeutic interventions, management, pharmacological, non-pharmacological, efficacy, effectiveness, and patient outcomes were employed to search relevant databases effectively. A 'wildcard' was used to expand the search results. However, Boolean operators (AND, OR, NOT) were to refine each term to further optimize the search results (As shown in [Table 2](#)).

Table 2. Inclusion and Exclusion Criteria

| Criteria | Inclusion | Exclusion |
|------------------|--|--|
| Population | Patients with cancer | Patients with delirium not related to cancer |
| Research Studies | Primary studies | Case reports, technical reports, theses, conference proceedings, or unpublished research |
| Study Focus | Studies focusing on the effects of treatment interventions on delirium complicated by cancer | Studies not reporting on the effect of treatment interventions on delirium complicated by cancer |

| | | |
|--------------|--|--|
| Participants | Over 18 years old | Participants under 18 years old |
| Publication | Peer-reviewed articles | Non-peer reviewed articles |
| Language | Studies reported in English language | Studies not reported in English language |
| Timeframe | Peer-reviewed articles published between 2008 and 2023 | Studies published more than 15 years (2008-2023) preceding the search date |

2.4. Study Selection and Characteristics

The initial database search retrieved a total of 614 studies. After removing 54 duplicate studies through title scanning, an additional 43 studies were excluded due to their titles clearly indicating they had no links with delirium in patients with advanced cancer. The remaining studies were screened by abstract, but not all could be retrieved. Thirteen papers met the inclusion criteria and were obtained in full text for independent review. Following this review, eight papers were deemed suitable for a complete critical review.

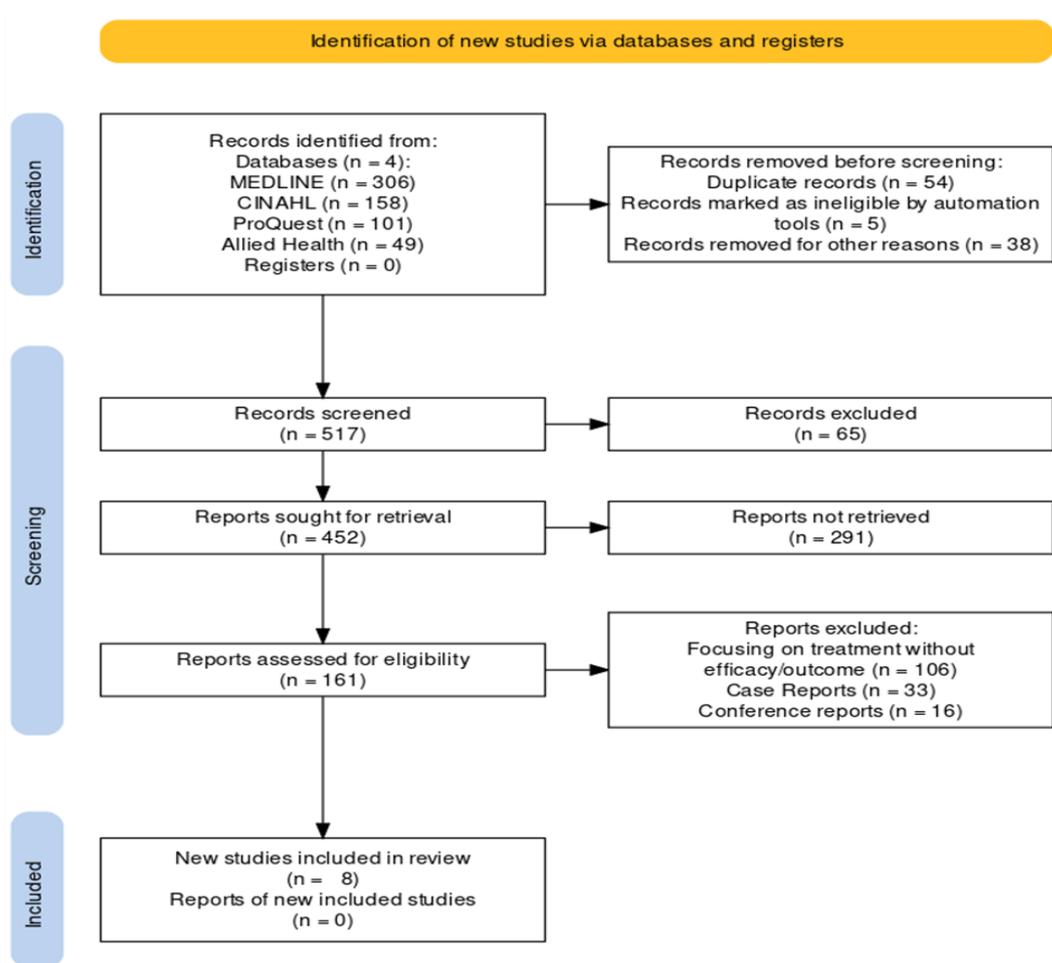


Figure 1. PRISMA flow chart of the study selection process

2.5. Quality Assessment of Selected Studies

Joanna Briggs Institute's (JBI) Critical Appraisal Tool, Checklist for Case Series [42] was used to assess the quality of the selected studies. This specific appraisal tool is applied to studies where all participants have a specific disease or specific disease-related outcome, making it appropriate for the current review where the specific disease under investigation was delirium in advanced cancer (As shown in Table 3).

Table 3. JBI Methodological Assessment of Studies

| Authors | Mercadante et al., 2018 [41] | De La Cruz et al., (2015) [11] | Chishi et al., (2023) [10] | Okuyama et al., (2019) [45] | Agar et al., (2017) [1] | Maeda et al., (2020) [39] | Tatematsu et al., (2011) [48] | Matsuda et al. (2020) [40] |
|---|------------------------------|--------------------------------|----------------------------|-----------------------------|-------------------------|---------------------------|-------------------------------|----------------------------|
| Were there clear criteria for inclusion? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Was the condition measured in a standard and reliable way for all participants? | Unclear | Yes | Unclear | Unclear | Yes | Unclear | Unclear | Yes |
| Were valid methods used in identifying conditions for all participants? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Did the case series have consecutive inclusion for all participants? | Yes | Unclear | Yes | Yes | Yes | Yes | Yes | Yes |
| Did the case series have a complete inclusion of participants? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Was there clear reporting of the demographics of the participants in the studies? | Yes | No | No | No | No | No | No | No |
| Was there clear reporting of the clinical information of the participants? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Were there outcomes or follow-ups of cases clearly reported? | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Was there clear reporting of the presenting site(s)/clinic(s) demographics? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Was statistical analysis appropriate? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Unclear |
| Total | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 |

2.6. Data Abstraction

The process of collecting data was based on the World Health Organization's definition of palliative care and the aim of this review. The information gathered from each study was organised into a spreadsheet including details such as the author and year, country of the study, title, study aim and design, sampling techniques, sample size, findings, and clinical relevance [43]. In addition, specific details regarding changes in the patient's delirium state, the type of care provided, treatments or interventions given, and the outcomes were also recorded. To ensure the accuracy and completeness of the collected data, a double-checking process was conducted by the researchers.

2.7. Data Synthesis

After gathering and assessing the data from the studies, a narrative synthesis approach was used to analyze the information thematically using the Braun and Clarke method [5] and following the 2020 definition of palliative care guidelines by World Health Organization (WHO). Only one randomized controlled trial examining interventions for delirium management in advanced cancer patients was found among the studies reviewed. The eight studies reviewed were grouped into three themes: prevalence, management, and reversibility of delirium in hospitalized cancer patients. Each theme was subdivided into subthemes that placed the findings of the studies in categories as illustrated in Table 5.

3. Results

The findings in the current review are outlined in [Table 4](#).

Table 4. Synopsis of Eligible Studies for the Review

| Author(s), Year & Country | Title | Aim | Design | Sampling and sample size | Findings | Clinical Relevance |
|-------------------------------------|--|---|--|---|---|--|
| Mercadante et al., 2018. Italy [41] | Prevalence of delirium in advanced cancer patients in home care and hospice and outcomes after 1 week of palliative care | To determine the prevalence of delirium in advanced cancer patients receiving palliative care and its outcomes after 1 week of intervention | Quantitative study; cross-sectional study. Data analysis: Descriptive statistics and logistic regression analysis | Convenience sampling, 329 patients | Delirium prevalence was 17.5% and decreased to 10.3% after 1 week of palliative care intervention - Palliative care is associated with a reduction in the incidence and severity of delirium. Delirium in hospitalized cancer patients generally reversible - Improvements observed with palliative care interventions, antipsychotic medications, and exercise therapy. | Palliative care intervention can improve delirium outcomes in advanced cancer patients |
| De La Cruz et al., 2015 USA [11] | The frequency, characteristics, and outcomes among cancer patients with delirium admitted to an acute palliative care unit | To describe the frequency, characteristics, and outcomes of cancer patients with delirium admitted to an acute palliative care unit | Quantitative study. Data analysis: descriptive statistics | Convenience sampling, 3,231 patients with advanced cancer | Delirium was present in 10.3% of patients admitted to the palliative care unit | Delirium is a common issue among cancer patients in the palliative care setting |
| Chishi et al., 2023 India [10] | Prevalence of Delirium in Advance Cancer Patients Admitted in Hospice Centre and | To determine the prevalence of delirium in advanced cancer patients admitted to a hospice centre and its outcome | Quantitative study; cross-sectional study. | Convenience sampling, 270 patients | Delirium prevalence was 24.1%, and it improved after palliative intervention. Addressing the physical, emotional, and spiritual needs of the patient | Palliative care intervention can improve delirium outcomes in advanced cancer patients admitted to hospice centres |

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|---------------------------------|---|--|---|--|--|---|
| | Outcome after Palliative Intervention | after palliative intervention | Data analysis: descriptive statistics and logistics regression analysis | | showed positive impacts - Incorporating palliative care interventions may be effective in managing delirium. Delirium in hospitalized cancer patients generally reversible - Improvements observed with palliative care interventions, antipsychotic medications, and exercise therapy | |
| Okuyama et al., 2019 Japan [45] | Current pharmacotherapy does not improve the severity of hypoactive delirium in patients with advanced cancer: pharmacological audit study of safety and efficacy in real-world (phase-R) | To assess the efficacy of current pharmacotherapy in managing hypoactive delirium in advanced cancer patients | Quantitative study. Data analysis: descriptive statistics | Convenience sampling, 548 patients | Current pharmacotherapy did not improve the severity of hypoactive delirium in advanced cancer patients | Current pharmacotherapy may not be effective in managing hypoactive delirium in advanced cancer patients |
| Agar et al., 2017 Australia [1] | Efficacy of oral risperidone, haloperidol, or placebo for symptoms of delirium among patients in palliative care: a randomized clinical trial | To assess the efficacy of oral risperidone, haloperidol, or placebo in managing symptoms of delirium in patients receiving palliative care | Randomized clinical trial Data analysis: Descriptive statistics, chi-square tests, and regression analysis | Stratified random sampling, 247 patients | Oral risperidone and haloperidol were not superior to placebo in managing symptoms of delirium in patients receiving palliative care | Oral risperidone and haloperidol may not be effective in managing symptoms of delirium in patients receiving palliative care |
| Maeda et al., 2020 Japan [39] | Safety and effectiveness of antipsychotic medication for delirium in patients with advanced cancer: A | To evaluate the safety and effectiveness of antipsychotic medication for delirium in patients with advanced cancer in | Quantitative method Data analysis: Descriptive statistics and logistic regression analysis | Convenience sampling, 583 patients | Antipsychotic medication was safe and effective in managing delirium in patients with advanced cancer in real-world palliative care settings | The study concludes that antipsychotic medication is a useful treatment option for managing delirium in these patients, but careful |

| | | | | | | |
|-----------------------------------|---|---|---|---|---|---|
| | large-scale multicentre prospective observational study in real-world palliative care settings | real-world palliative care settings | | | Antipsychotic medication was generally well-tolerated by patients | monitoring is necessary to prevent potential adverse effects, particularly in patients with pre-existing cardiovascular and neurological conditions |
| Tatematsu et al., 2011 Japan [48] | The effects of exercise therapy on delirium in cancer patients: a retrospective study | To investigate the effects of exercise therapy on delirium in cancer patients | Quantitative study. Data analysis: descriptive statistics | Consecutive sampling Patients with delirium (n=31) & without delirium (n=43) | Exercise therapy was associated with a significantly lower incidence of delirium in cancer patients (p<0.05) | Exercise therapy may be a useful intervention for preventing delirium in cancer patients. |
| Matsuda et al. 2020 Japan [40] | Reversibility of delirium in ill-hospitalized cancer patients: Does underlying etiology matter? | To investigate the reversibility of delirium in hospitalized cancer patients and to evaluate the impact of the underlying aetiology on delirium reversibility | Quantitative study; cross-sectional study. Data analysis: descriptive statistics and logistics regression analysis | Consecutive sampling Participants were 169 hospitalized cancer patients with delirium. | Delirium reversed in 60.9% of patients, and the reversibility rate was higher in patients with reversible aetiologies (66.3%) than in those with irreversible aetiologies (37.9%). Multicomponent interventions involving non-pharmacological approaches were effective - Environmental modifications reduced the severity and duration of delirium. Delirium in hospitalized cancer patients generally reversible - Improvements observed with palliative care interventions, antipsychotic medications, and exercise therapy. - Delirium reversibility rate may vary depending on the underlying | The study suggests that delirium in hospitalized cancer patients is reversible in the majority of cases, but the reversibility rate may vary depending on the underlying aetiology. Identification and management of underlying aetiologies may improve delirium outcomes in these patients. |

etiology - Identifying and managing underlying etiologies crucial in improving delirium outcomes

Table 5. Synthesis of Studies on Delirium in Patients with Advanced Cancer

| Theme | Subtheme | Study | Findings |
|--|---|-------------------------------|---|
| Prevalence of Delirium in Advanced Cancer Patients | Delirium prevalence in palliative care for advanced cancer | Mercadante et al. (2018) [41] | - 17.5% of advanced cancer patients experienced delirium during palliative care - Delirium decreased to 10.3% after one week of intervention |
| | | Chishi et al. (2023) [10] | - Delirium prevalence rate of 24.1% - Improvement observed after palliative intervention |
| | | Maeda et al. (2020) [39] | - 22.1% of advanced cancer patients experienced delirium during palliative care |
| | Prevalence of delirium in diverse palliative care settings | De La Cruz et al. (2015) [11] | - A 10.3% delirium prevalence rate among cancer patients admitted to an acute palliative care unit - A 30.5% delirium incidence rate in patients admitted to an acute palliative care unit |
| | | Chishi et al. (2023) [10] | - A 62% delirium prevalence rate among patients admitted to a hospice center - Reduced to 24.1% with treatment |
| | | Mercadante et al. (2018) [41] | - 11.5% delirium prevalence rate among advanced cancer patients in home care and hospice |
| Management and Treatment of Delirium in Advanced Cancer Patients | Efficacy of pharmacological interventions in the management of delirium in advanced cancer | Agar et al. (2017) [1] | - Risperidone and haloperidol are more effective than placebo in reducing delirium symptoms - No significant difference between the two antipsychotics in terms of efficacy or safety |
| | | Okuyama et al. (2019) [45] | - Current pharmacotherapy did not improve the severity of hypoactive delirium in patients with advanced cancer |
| | | Maeda et al. (2020) [39] | - Antipsychotic medication for delirium was effective and safe in real-world palliative care settings |
| | Efficacy of non-pharmacological approach in management of delirium in advanced cancer | Tatematsu et al. (2011) [48] | - Exercise therapy effective in reducing delirium in cancer patients |
| | | Mercadante et al. (2018) [41] | - Palliative care associated with a reduction in the incidence and severity of delirium |
| | | Matsuda et al. (2020) [40] | - Multicomponent interventions involving non-pharmacological approaches were effective- Environmental modifications reduced the severity and duration of delirium |
| Chishi et al. (2023) [10] | - Addressing the physical, emotional, and spiritual needs of the patient showed positive impacts- Incorporating palliative care interventions may be effective in managing delirium | | |

| | |
|--|---|
| <p>Reversibility of Delirium in Hospitalised Cancer Patients</p> | <p>Mercadante et al. (2018) [41], Chishi et al. (2023) [10], Matsuda et al. (2021) [40], Matsuda et al. (2021) [40], Okuyama et al. (2019) [45], Agar et al. (2017) [1]</p> <p>- Delirium in hospitalized cancer patients generally reversible- Improvements observed with palliative care interventions, antipsychotic medications, and exercise therapy</p> <p>- Delirium reversibility rate may vary depending on the underlying etiology- Identifying and managing underlying etiologies crucial in improving delirium outcomes</p> <p>- Pharmacotherapy for managing delirium symptoms may have limited efficacy in hypoactive delirium subtype</p> <p>- Risperidone and haloperidol effective in managing delirium symptoms in palliative care patients</p> |
|--|---|

4. Discussion

Delirium is indeed a significant concern among advanced cancer patients receiving palliative care, as indicated by multiple studies. The theme of the prevalence of delirium in advanced cancer patients emerged as a consistent finding across the reviewed studies. For instance, a research conducted on the prevalence of delirium during palliative care found a rate of 17.5% [41]. However, after one week of intervention, the prevalence decreased to 10.3%. Similarly, a higher prevalence rate of 24.1% among advanced cancer patients has also been reported, which significantly improved following palliative interventions [10]. These findings emphasize the common occurrence of delirium in this patient population and the potential for improvement with appropriate interventions.

It has been established that chronic metabolic disorders have the ability to contribute to mental illnesses e.g. dementia, due to their chronic debilitating nature. Metabolic disorders e.g. Hypertension, Adiposity, Diabetes mellitus and Dyslipidemia collectively known as Metabolic Syndrome Diseases (MSDs) are diseases related to one another and have very high morbidity and mortality rates [15, 16, 18, 33, 35, 52]. Results obtained from different researches have shown that hypertension, diabetes mellitus, adiposity and dyslipidemia, asymptomatic hyperuricemia, systemic immune inflammation activation and fibrogenesis, can lead to kidney damage [19, 20, 21, 23, 24, 25, 30, 32, 34, 53, 54, 55, 56, 60], and can also affect the brain blood supply leading to neuronal damage.

The prevalence of delirium can vary across different palliative care settings. A prevalence rate of 10.3% among cancer patients admitted to an acute palliative care unit has been reported [11], while a higher prevalence rate of 62% among patients admitted to a hospice center has also been reported. However, with treatment, the prevalence reduced to 24.1% [10]. In addition, a prevalence rate of 11.5% among advanced cancer patients receiving home care and hospice has been reported [41]. These variations highlight the influence of specific palliative care settings on the prevalence of delirium. Therefore, it is evident that delirium is a significant concern among advanced cancer patients in palliative care, and tailored interventions are necessary to address and improve their outcomes. This suggests that the occurrence of delirium can be influenced by factors specific to the healthcare environment and patient population.

In the realm of managing and treating delirium, various studies have delved into the effectiveness of pharmacological interventions. A randomized clinical trial was conducted to investigate the impact of oral risperidone and haloperidol on delirium symptoms in palliative care patients [1]. The results of the study revealed that both medications were more effective than placebo in reducing delirium symptoms. This finding provides evidence for the potential efficacy of pharmacotherapy in managing delirium in palliative care settings. However, contrasting findings regarding the effectiveness of current pharmacotherapy in addressing hypoactive delirium in patients with advanced cancer has been presented [45]. The research indicated that the current pharmacological approaches did not improve the severity of hypoactive delirium. This disparity in outcomes underscores the complexity of delirium management and highlights the need for further research to explore alternative treatment options.

Nevertheless, there is also need for new and effective treatment options in patients with Metabolic Syndrome Diseases. Sodium-Glucose Linked Transporter 2 (SGLT-2) inhibitors e.g. Dapagliflozin and Glucagon-like Peptide 1 Receptor Agonists (GLP-1 RAs) e.g. Liraglutide have been found to improve the efficacy of treatment and clinical course of type 2 diabetes mellitus and hypertension in patients with such comorbidities [17, 22, 26, 31, 57, 58, 59]. It has also been documented that coconut water has hepatorenal protective functions in alloxan-induced type 1 diabetes mellitus [13].

Building on previous studies, a large-scale study was conducted to assess the safety and effectiveness of antipsychotic medication in reducing delirium symptoms in patients with advanced cancer [39]. The study demonstrated that antipsychotic medication was not only effective in alleviating delirium symptoms but also generally well-tolerated by patients. This finding suggests that antipsychotic medication, when administered with caution and considering individual patient characteristics, can be a valuable option for managing delirium in palliative care settings.

Non-pharmacological interventions have emerged as valuable approaches to managing delirium among advanced cancer patients. Exercise therapy, in particular, has demonstrated promising results. A study showcasing the effectiveness of exercise therapy in reducing delirium in cancer patients, and underscoring the potential of physical activity in delirium management was conducted [48]. Moreover, palliative care itself has been associated with a reduction in the occurrence and severity of delirium. Different independent studies found out that palliative care interventions were linked to a decrease in delirium incidence [11, 41]. These studies highlight the positive impact of holistic palliative care in mitigating delirium among advanced cancer patients.

Multi-component interventions have also gained attention for their effectiveness in addressing delirium. Researchers have investigated interventions that incorporated cognitive stimulation, music therapy, and environmental modifications [40, 41]. Their findings demonstrated positive outcomes in reducing delirium symptoms. In a study, environmental modifications, including increasing natural light exposure and minimizing noise, proved effective in reducing the severity and duration of delirium in hospitalized cancer patients [40].

Different studies have collectively highlighted the potential benefits of non-pharmacological interventions in managing delirium among advanced cancer patients [11, 40, 41, 48]. The findings underscore the significance of comprehensive and individualized care approaches to address delirium in the vulnerable patient population because if scientifically proven to be effective, it would be highly useful in nursing care considering that they are much cheaper options with lesser risk of exposure to the chemical side-effects of medications.

The reversibility of delirium in hospitalized cancer patients has been explored in several studies, shedding light on its potential for improvement. Notably, interventions such as palliative care, antipsychotic medications, and exercise therapy have shown promise in alleviating delirium symptoms [10, 40, 41]. These findings indicate that delirium is a reversible condition and can be effectively addressed through targeted interventions. Furthermore, the influence of the underlying cause of delirium on its reversibility has also been highlighted [40]. Patients with reversible causes exhibited higher rates of reversibility compared to those with irreversible causes. This underscores the importance of identifying and managing the underlying etiologies of delirium to enhance outcomes in hospitalized cancer patients. By targeting and addressing the specific factors contributing to delirium, healthcare providers can potentially improve the chances of reversibility and optimize the overall well-being of patients.

In as much as both pharmacological and non-pharmacological interventions have been reported to alleviate symptoms in delirium management among cancer patients, the unique characteristics of each patient, the specific subtype, and the severity of delirium should be considered when determining the most appropriate treatment approach. Existing works of literature are limited, therefore further research is needed to explore alternative treatment options, enhance our understanding and treatment approaches, and investigate subtype-specific treatments tailored to the underlying cause(s) of delirium. The development of standardized protocols and guidelines for delirium management in advanced cancer patients is also highly necessary.

One limitation of this present study is that the limited number of randomized controlled trials (RCTs) restricts this present study's ability to draw robust conclusions about the efficacy of specific therapeutic interventions for delirium.

5. Conclusion

Implementation of palliative care interventions, utilization of antipsychotic medications, and incorporation of exercise therapy have shown promising results in improving delirium symptoms. Therefore, early identification and management of underlying causes play a crucial role in enhancing the reversibility of delirium and ultimately improving clinical outcomes for patients.

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Conflict of Interest: The authors guarantee responsibility for everything published in this manuscript, as well as the absence of a conflict of interest and the absence of their financial interest in performing this review research and writing this manuscript. This manuscript was written from a review research work.

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