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Original Research Article

Assessment of Pain and Usage of Analgesic Drugs among Patients with Advanced Cancer and Inpatient Palliative Care in a Tertiary Care Teaching Hospital in North India

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Abstract:

Background: Among patients with advanced cancer, pain is one of the most common and persistent symptom of the disease and its treatment. Approximately 70% to 80% of these patients experience pain, which still remains poorly controlled in 40% of patients. Pain is a distressing symptom in such patients, significantly affecting their quality of life as well. Effective pain management is therefore essential in palliative care to ensure patient comfort and dignity. This study focuses on assessing pain levels and the use of analgesic drugs among these patients, aiming to provide insights into current practices and suggest improvements where necessary.

Aim & Objective: To assess the intensity of pain and its management with the usage of analgesic drugs among patients admitted in oncology ward of a tertiary care teaching hospital in North India.

Methods and Materials: A cross-sectional, observational, study was conducted after taking IEC approval, over period of six months among patients with advanced cancer receiving palliative care, of a tertiary care teaching hospital in North India. A total of 200 patients diagnosed with advanced cancer that were receiving inpatient palliative care, in oncology ward of government medical college were enrolled for this study. The data obtained from the study was tabulated in number and percentage.

Results: Out of total patients analyzed, majority patients were males (63%), mostly belonging to age group of 51-60 years. The most prevalent cancer type was genitourinary followed by ca breast. A good pain control was seen in 70% of patients after round-the-clock dosing and using adjuvant treatments along with analgesics. Morphine was the most commonly used opioid for severe pain followed by tramadol for moderate to severe pain & few Adjuvant Analgesics were also used to manage neuropathic pain.

Conclusion: After analyzing the efficacy of pain management protocols, though pain management strategies were adequate for majority of patients, but still inadequate pain management among 30% of patients was observed in our study. While opioid analgesics are widely used, there is a need for more personalized and timely interventions to achieve optimal pain relief. Regular pain assessments and dose adjustments based on patient feedback can enhance the effectiveness of pain management protocols.

Keywords: Pain, Advanced Cancer, Analgesic drugs, WHO analgesic ladder, Palliative care.

Introduction

Cancer has emerged to be the leading cause of morbidity and mortality worldwide, exerting tremendous physical, emotional and financial burden on individuals, families, communities and health systems. The GLOBOCAN 2018, reported 18.1 million new cancer cases and 9.6 million deaths globally. The emergence of cancer and its mortality are expected to rise to 29.5 million and 16.3 million, respectively, by 2040 [1]. In India, 1 million new cases of cancer are diagnosed each year, and it is estimated that the cancer burden in India will almost double during the coming 20 years [2]. Approximately 60% to 80% of currently diagnosed patients are identified when the disease is at an advanced stage; 70% to 80% of these patients experience pain [3]. Pain is a multidimensional and complex experience that has physical, social, spiritual and psychological aspects [4,5]. Among patients with cancer, pain is a common and persistent symptom of the disease and its treatment. Cancer pain is a common complication that is frequently undertreated in patients with cancer, significantly affecting their quality of life [3,6]. However, most cancer pain can be treated effectively through the progressive use of analgesic medicines. This approach has been shown to control 70% to 90% of pain in patients with cancer [7]. Effective pain management is therefore essential in palliative care to ensure patient comfort and dignity. This study focuses on assessing pain levels and the use of analgesic drugs among these patients, aiming to provide insights into current practices and suggest improvements where necessary.

Assessment: The cornerstone of adequate pain management is a thorough patient assessment and frequent reassessment. A complete history and a physical examination, with emphasis on the patient's symptoms, are obtained, including information regarding the location, intensity, radiation, aggravating factors, timing, quality, and meaning of the pain. Medications and treatments are reviewed, and a psychosocial history is taken [8].

Intensity: The intensity or severity of the pain must first be quantified. Various pain rating scales that have been used for more than a decade allow patients to quantify their pain so that health care providers can determine the effectiveness of the therapy. The most commonly used is the numeric rating scale. Pain is rated on a scale of 0-10, with 8-10 being severe pain, 4-7 moderate pain, and 1-3 mild pain [9]. Other scales, including the visual analog scale and the verbal rating scale, are available to quantify the patient's pain.. Once the patient is receiving therapy, pain can be tracked by utilizing the pain scale. This approach also allows the patient to objectively evaluate the efficacy of the therapy. Since most patients have variable tolerances to pain, patients should frequently be asked if the pain is interfering with their daily activities.

Location: Precisely locating the discomfort can also help in determining the type and nature of the pain. Well-localized pain that does not radiate may be somatic in nature and be indicative of metastatic disease to the bone. Pain that follows a dermatome distribution may be neuropathic in nature and may represent a radiculopathy. Poorly localized, deep pain may be visceral in nature.

Aggravating/Relieving Factors: Factors that increase or decrease the intensity of the pain can aid in the management of the patient's symptoms and reveal the efficacy of treatment. Pain that increases with movement, especially if an extremity is involved, often signifies bony involvement of that limb. Pain that intensifies in the recumbent position may mean involvement of the spine, and prompt action should be undertaken. Pain that worsens with a light touch is known as allodynia.

Quality: Patients are offered a list of adjectives to describe their pain. Pain that is described as burning, shooting, electrical, "pins and needles" and often constant in nature is typically neuropathic. Somatic pain is often described as sharp, aching, constant, well localized, and worse with movement. Visceral pain can be deep, lancinating, episodic, colicky, and often poorly localized.

Timing: Pain that increases or intensifies at certain times of the day generally indicates that the medication dosage is inadequate. More frequent use or changing to longer-acting medications should be considered.

Radiation: Pain that radiates over dermatome or nerve distributions can help in localizing the tumor or provide insight into the type of the pain. Meaning of the Pain: Many patients regard an increase in pain as a sign that their disease is progressing or that uncontrolled pain is inevitable, which can lead to despair and hopelessness. So, they need reassurance that their pain can be controlled and quality of life can be maintained.

Pain Management: In recognizing the need for improved pain management worldwide, the World Health Organization (WHO) instituted a three-step analgesic ladder as a basis for pain management

Step 1 - Mild Pain: acetaminophen or NSAID +/– adjuvant.

Step 2 - Mild to Moderate: weaker opioid for mild to moderate pain + acetaminophen or NSAID +/– adjuvant.

Step 3 - Moderate to Severe Pain: stronger opioid for moderate to severe pain + acetaminophen or NSAID +/– adjuvant. [10]

The WHO also recommended that in the relief of cancer pain, medication be given according to the following framework By Mouth, Around the Clock, By the Ladder & with Attention to Detail. The types of pain medications should be changed according to the severity of the pain, using the WHO stepwise approach as a guide to maximize pain relief and patients need to be closely monitored for the efficacy of the intervention and the appearance of side effects during therapy. [11]

Opioid Use: The goal of good pain management is to minimize both the patient's pain and the need for breakthrough medication. Opioids are the mainstay of pain control in patients with advanced disease, and they are effective in treating most types of pain. A proper use of opioids and adjuvant drugs can provide adequate relief in most cases. Opioid therapy is initiated when a trial of NSAIDs or acetaminophen is no longer effective. Using the WHO guidelines, a weak opioid is initially used and then titrated to a stronger medication. Important elements in successful opioid use include frequent reassessment of the patient's pain, attention to the prevention of side effects, and effective communication. All patients should begin with a stool softener when opioid therapy is started.[12]

Morphine is often referred to as the "gold standard" in palliative care because it is effective, inexpensive, and easy to titrate. Titration typically begins with a low oral. The typical starting dose is 10-30 mg every 4 hours as needed for pain with 10 mg every 2 hours when needed for breakthrough pain [13]. Close monitoring of the patient's symptoms through frequent reassessment helps for titration of the opioid. Titrating the opioid can be accomplished either by adding the total amount of breakthrough medication to the long-acting preparation or by increasing the dose by 25%-50% from the previous day depending on the severity of the patient's pain. Transdermal fentanyl patches are very commonly used for cancer pain management as a long-acting opioid like Fentanyl. These patches are applied once every 3 days and deliver 25, 50, 75, 100 µg/hr of fentanyl. Since this type of delivery system is easy to use and has good efficacy, it is becoming more frequently used by palliative care physicians.

According to WHO Palliative Care is defined as an approach that focuses on improving the quality of life of patients and that of their families who are facing challenges associated with life-threatening illness, whether physical, psychological, social or spiritual.[14]. Palliative care is also called comfort care, supportive care and symptom management and patients may receive palliative care in hospital, an outpatient clinic, a long term care facility or at home under the direction of physician. To ensure optimum relief effective & evidence based management of cancers the corner stone of comprehensive cancer care and safety involves both pharmacological, non-pharmacological and other modalities. Palliative care is now one such form of management which has shown to be of utmost importance [15].

Non-pharmacologic Approaches to Pain Control

The mainstay in the treatment of cancer pain is pharmacologic intervention. Non-pharmacologic techniques, however, are also effective in relieving cancer pain. These interventions can be divided into physical and psychosocial modalities. Physical interventions include massage, acupuncture, exercise and stretching, passive range of motion, heat therapy, transcutaneous electrical nerve stimulation, and immobilization. Psychosocial interventions include relaxation techniques, imagery, support groups, family counseling, education, biofeedback, and psychotherapy. These types of non-pharmacologic pain control methods are often offered by hospice organizations or palliative care teams and are available if requested by the patient or family or if recommended by the clinician.[16]

Aim & Objectives:

1. To evaluate the intensity of pain experienced by patients with advanced cancer.
2. To analyze the patterns of analgesic drug usage in these patients.
3. To assess the effectiveness of current pain management protocols.
4. To identify potential gaps and areas for improvement in pain management practices.

Material & Methods

A cross-sectional study was conducted after taking IEC approval, over period of six months, from June 2024 to November 2024, among patients with advanced cancer receiving palliative care, of a tertiary care teaching hospital in North India. A total of 200 patients diagnosed with advanced cancer that were receiving inpatient palliative care, in oncology ward of government medical college were enrolled for this study.

Data Collection: Data were collected using the following methods:

1. Pain Assessment: The Numeric Rating Scale (NRS) was used to measure pain intensity, with scores ranging from 0 (no pain) to 10 (worst possible pain).
2. Analgesic Usage: Patient medical records were reviewed to document the types and doses of analgesic drugs administered.
3. Patient Interviews: Interviews were conducted to gather data on patient experiences and satisfaction with pain management on self-designed questionnaire.

Statistical Analysis: The data obtained from the study was tabulated in mean ± SD/SEM and percentage for continuous and descriptive data respectively. The p-value less than 0.05 were considered statistically significant.

Results:

Sociodemographic Features: Out of 200 patients analyzed, 126 were males (63%) and 73 females (37%), mostly belonging to age group of 51-60 years with mean age of 54.17± 14.79. Majority of population dwelled in rural background (79%) with low socio-economic status. In term of employment status, a significant proportion (74%) of study population was educated followed by (26%)

uneducated. The most prevalent cancer type was genitourinary followed by ca breast.

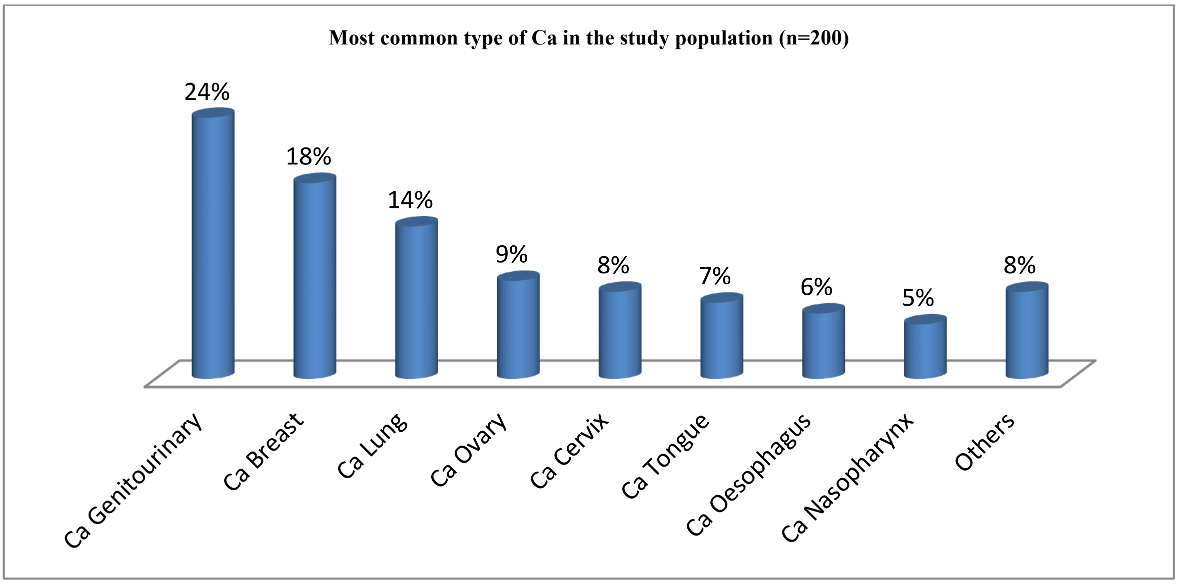

Figure 1: Most common type of cancer in the study population (n=200)

In the study population, children (46%) were the most common primary care givers with the patient, followed by spouse (36%), relatives (12%) and parents (6%) as shown in table no: 1.

Table 1: Primary Caregiver with patient (n=200)

Primary caregiver	Number (n=200)	Percentage (%)
Spouse	72	36%
Children	92	46%
Relatives	24	12%
Parents	12	06%

It was also noted that the most common indication for the referral of patient to palliative care unit was Pain (96%) which was then followed by lack of appetite(52%), Insomnia(45%), Nausea & vomiting(49%), Dynpnoea (26%), Constipation (35%), Anxiety (29%) and few others.

Table 2: Time of presentation in palliative care unit after initial cancer diagnosis (n=200)

Time of presentation (in days)	Number (n)	Percentage (%)
Less than 8 weeks	58	29%
<6 months	46	23%
`6 months -1 year	50	25%
>1 year	46	23%
Total	200	100%

Taking into account the time of presentation of patients to palliative care unit after the initial diagnosis of cancer was made, it was observed that, 29 % of our study participants were received within first 8weeks of their diagnosis, 23% within 6months, 25 % between 6months to one year and 23 % more than one year time period as shown in Table no 2.

Pain Intensity

Our findings revealed that pain (96%) was the most common symptom among patients who were admitted to palliative care unit with varying degree of severity. Among 200 study participants, a vast majority of patients (63%) were having severe pain (NRS scores 6-10), followed by 32.5% moderate and 4.5% mild pain. The mean pain score was 6.2, indicating a significant burden of pain among the study population. Table no: 3.

Table 3: Pain severity in study population.

S.no	Pain severity	Number (n=200)	Percentage (%)
1	**Severe**	126	63%
2	**Moderate**	65	32.5%
3	**Mild**	09	4.5%

Analgesic Usage

1. Non-Opioid Analgesics: 13% of patients were prescribed non-opioid analgesics such as Paracetamol and NSAIDs.

2. Opioid Analgesics: 87% of patients received opioid analgesics, including tramadol morphine and fentanyl. Among these, morphine, via oral route was the most commonly used opioid followed by tramadol via IV route.

3. Adjuvant Analgesics: 30% of patients were administered adjuvant analgesics like antidepressants and anticonvulsants including Nortriptyline, Amitriptyline, Pregabalin & few others, to manage neuropathic pain.

Table 4: Drugs under WHO Analgesic Ladder (n=200)

WHO LADDER	Number n (%)	Percentage (%)
Step I	26	13%
Step II	70	35%
Step III	104	52%
Total	200	100%

In palliative care unit WHO analgesic ladder was used for adequate pain management of cancer pain, where majority of the drugs used for patients (52%) fell under Step III of the ladder followed by Step II (35%) and Step I (13%) as seen in table no 3. Among them the most common prescribed drugs were, paracetamol in step I, tramadol in Step II and morphine in Step III of ladder. (Table no: 4).

Pain Assessment of Study Population:

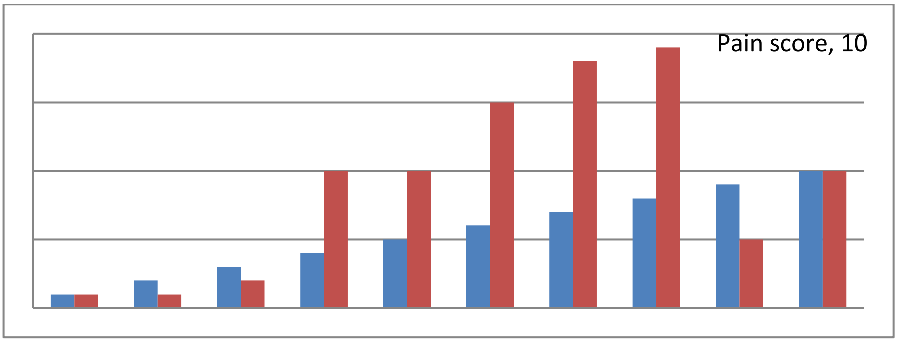

Figure 2: Pain Score Before treatment

While taking pain score of study population into consideration it was noted that maximum pain experienced by patients was between 7-10, while 38% of them complained about experiencing pain throughout the day which was exaggerated mainly by movement (16%), while with few other factors included walking (6%), sitting and eating, as shown in fig no:2.

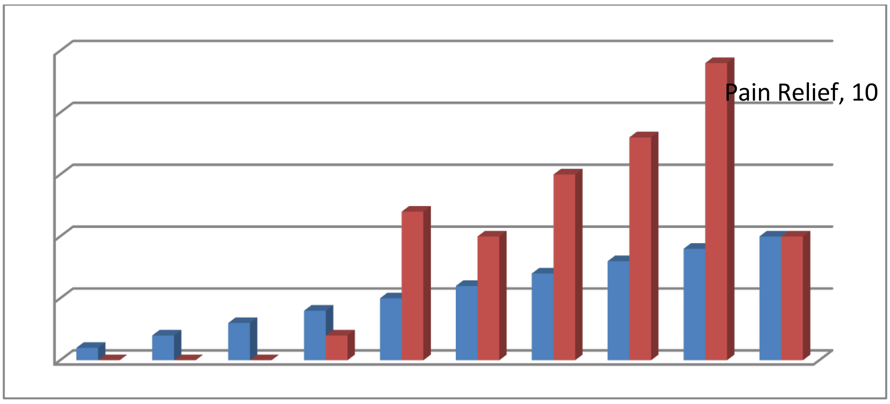

Figure 3: Pain Relief Score

As far as pain relief was concerned about 12% informed of pain relief after lying down, followed by eating and sitting (2%). 96% subjects confirmed of receiving treatment for pain, among them maximum pain relief score was seen between 6-10, while a low pain relief score (7) and no pain relief in few subjects (4) was also observed. When confirmed from the patient's maximum pain relief was for 4-6 hours (68) followed by 6-8 hours (96), least pain relief score was for 2-4hours seen in (26) patients as seen in Fig.no:3.

Effectiveness of Pain Management: Despite the widespread use of analgesics, 30% of patients reported inadequate pain relief. Factors contributing to inadequate pain management may include; Insufficient dosing of analgesics, delay in pain assessment and intervention and lack of regular pain monitoring.

Patient Experiences: Qualitative data revealed that patients appreciated the compassionate care provided by the palliative care team but expressed the need for more timely and effective pain relief measures. Common themes included; most importantly concerns about side effects of opioid usage like addiction, desire for better and detailed communication regarding pain management plans and need for psychological support alongside pain management.

Discussion

After assessing the pain levels and usage of analgesic drugs among 200 patients with advanced cancer receiving palliative care, the findings provide important insights into the pain management practices and challenges faced in a palliative care setting. The most common indication for referral to PCU in our study population was Pain (92%) [17]. The Pain can either be due to disease process itself or the treatment (surgical, chemotherapy, radiotherapy & others). In our study, pain remains one of the commonest and distressing symptoms perceived by cancer patients, with varying degree of severity. These findings were in sync with several other studies as well [18,19] .

Prevalence and Severity of Pain among Patients with Advanced Cancer: The study found that a significant proportion (92%) of patients with advanced cancer experienced moderate to severe pain, highlighting the high prevalence of pain in this population. This finding is consistent with previous studies, which have reported that pain is a common symptom in advanced cancer patients, affecting up to 70–90% of individuals in palliative care settings [20, 21]. The high prevalence of pain among these patients emphasizes the need for effective pain management strategies to improve their quality of life. However, despite the availability of analgesic drugs and pain management protocols, the persistence of moderate to severe pain suggests that there may be gaps in pain assessment, timely administration of analgesics, or adherence to pain management guidelines.

Usage Patterns of Analgesic Drugs: The study revealed that the majority of patients (85%) were prescribed opioid analgesics, such as morphine and tramadol, for the management of moderate to severe pain, while non-opioid analgesics and adjuvant therapies were used in 35% of cases. The widespread use of opioids aligns with the World Health Organization (WHO) guidelines for pain management in cancer patients, which recommend opioids for moderate to severe pain.[22] However, the reliance on opioids also raises concerns about potential issues related to opioid-induced side effects, tolerance, and dependency, which need to be managed carefully in palliative care settings. Additionally, the study found that around 40% of patients received combination therapy (opioid and non-opioid analgesics), suggesting an attempt to balance effective pain relief with minimizing opioid-related side effects. Combination therapy is often recommended for complex pain syndromes in cancer patients to achieve better pain control and enhance the quality of life [23]

Barriers to Effective Pain Management: Despite the use of analgesics, 30% of patients continued to report inadequate pain relief, indicating potential barriers to effective pain management. The barriers identified in this study include inadequate pain assessment, delayed titration of analgesics, patient reluctance to report pain, and concerns about addiction and side effects. These barriers are commonly reported in pain management literature and can significantly affect pain outcomes.[24, 25]

Healthcare professionals' knowledge and attitudes towards pain management also play a crucial role. Inadequate training in pain management and concerns about opioid use can lead to under-prescription or delayed administration of analgesics. These findings suggest the need for ongoing education and training of healthcare providers to address these barriers and improve pain management practices. [26]

Role of Multimodal Pain Management: The study highlights the importance of a multimodal approach to pain management in palliative care, which includes pharmacological and non-pharmacological interventions. While opioids remain the cornerstone of pain management, non-opioid analgesics, adjuvant therapies (such as corticosteroids and anticonvulsants), and non-pharmacological approaches (such as physiotherapy, psychological support etc) should be integrated into care plans. This approach not only targets pain but also addresses other symptoms that may contribute to the overall pain experience, such as anxiety, depression, and insomnia. [27]

Implications for Clinical Practice: The findings from this study have several implications for clinical practice. i) There is a need for regular and systematic pain assessments using validated pain scales to guide analgesic prescriptions and titration.

The study highlights gaps in the assessment that need to be addressed to ensure timely intervention and effective pain relief. ii) Pain management should be personalized based on individual patient needs, considering factors such as pain severity, type of pain (nociceptive vs. neuropathic), and patient preferences.

Regular reassessment and adjustment of analgesic regimens are necessary to achieve optimal pain control. iii) Addressing Barriers to Pain Management. Educational initiatives targeting healthcare providers and patients can help overcome barriers related to opioid use, such as fear of addiction and side effects. Improving communication between patients and healthcare providers is also crucial to ensure that patients feel comfortable reporting pain and receiving appropriate treatment. iv) Strengthening Multidisciplinary Teams. Effective pain management in palliative care requires a multidisciplinary approach involving oncologists, palliative care specialists, pain management teams, pharmacists, psychologists, and social workers. Collaboration among these professionals can help develop comprehensive care plans that address the physical, psychological, and social aspects of pain.

Recommendations

1. Implement regular pain assessment protocols using standardized tools like NRS.
2. Training of healthcare providers in effective pain management strategies, including appropriate dosing of analgesics.
3. Patient education on pain management plans and potential side effects of analgesics.
4. Integration of psychological support services to address the emotional aspects of pain.

Limitations and Future Research

This study is not without limitations. It was conducted in a single tertiary care teaching hospital, which may limit the generalizability of the findings to other settings. Future studies should aim to include multiple centers across different regions to better understand the variability in pain management practices. Additionally, qualitative research exploring patient and healthcare provider experiences can provide deeper insights into the barriers and facilitators of effective pain management.

Conclusion

The study demonstrates that while opioid analgesics are widely used for pain management among patients with advanced cancer in a palliative care setting, still a gaps in pain relief remain, suggesting the need for more effective pain management strategies. Addressing barriers to pain management, enhancing the use of multimodal approaches, and promoting regular pain assessment are crucial steps towards improving pain management outcomes for these patients. Enhanced training, better communication, and multidisciplinary collaboration are essential to achieving optimal pain control and improving the quality of life for patients with advanced cancer.

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