

A multicentre survey of pain management in cancer patients and physicians attending radiotherapy clinics in Shandong Province, China

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Abstract

Objective: To obtain a better understanding of the prevalence and management of pain in patients undergoing radiotherapy for cancer in Shandong Province, China.

Methods: This cross-sectional study used a questionnaire during face-to-face interviews to collect data from physicians and patients regarding the recognition, prevalence and treatment of pain during the waiting period before commencement of radiotherapy and during the radiotherapy period. Physicians and patients were recruited from 10 tertiary Class A hospitals across Shandong Province, China.

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Results: A total of 184 patients and 87 physicians were recruited to the study. During the waiting period, pain was reported by the physicians according to their experience to affect 26.0% of patients, which almost agreed with the patients' data (36.5%; 160 of 438). During the radiotherapy period, there was a significant difference in the reported prevalence of pain during the radiotherapy period between the physicians' data (23.0%) based on their experience and the patients' data (84.1%; 169 of 201 patients). The majority of physicians (98.9%; 86 of 87) agreed to the use of opioids for pain management and 90.8% (79 of 87) were satisfied with the analgesic effect, but more than half of the patients who received pain treatment reported inadequate analgesia.

Conclusion: There was a high incidence of cancer pain, but insufficient assessment, inadequate treatment and inadequate education about pain in both the waiting and radiotherapy periods.

Keywords

Cancer pain, surveys, questionnaires, pain measurement

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Introduction

By 2020, two-thirds of cancer cases will occur in the developing countries.¹ In China, the annual cancer incidence increases by 2.2 million every year, among which 1.1 million are likely to suffer from pain.² It is reported that 70–80% of cancer patients in the advanced stage experience pain of varying intensity.³ Although radiotherapy, surgery and chemotherapy have achieved notable effects in the cure and control of cancer, pain is still one of the most prevalent recurrent symptoms experienced by cancer patients.⁴ There is evidence showing that cancer pain (CP) has a negative effect on patients' functional status and quality of life.⁵ Therefore, pain management is considered as an essential component and a primary goal of treatment in cancer.⁶

The World Health Organization (WHO) published guidelines for pain management in 1986, which aimed at solving the problem of inadequate analgesia by following the three-step analgesic ladder.⁷ Opioid-based analgesic therapy is suggested as a first-

line treatment option by several international guidelines.^{8,9} Despite drug and non-drug analgesia being potentially effective in most CP,¹⁰ under-treatment of pain still exists. Studies have revealed that nearly 80–90% of CP can be controlled.¹¹ In fact, 40% of cancer patients have reported to experience pain in varying degrees.^{12,13} A number of studies conducted in European countries and in other parts of the world also revealed similar results,^{14–16} however, inadequate pain management in cancer is indeed a current challenge in China. As far as we know, one of the problems is the regulation of opioid distribution and its accessibility for treatment purposes.¹⁷ In addition, some barriers that have been identified are the physicians and cancer patients' attitude towards pain management, lack of related education and fear of drug addiction.^{18–20} Therefore, inadequate pain management in cancer leads to decreased function and a worse quality of life of patients.⁵ The consequences of inadequate pain management are exacerbated in developing Asian countries due to the socioeconomic burden associated with

life-threatening disease conditions.²¹ Inadequate assessment of pain, opioid access and regulations, and stigmas associated with opioid use are significant barriers to optimal pain management.²¹ The ability to undertake informed policy decisions will require relevant data regarding CP management practices in Asia.

This current study aimed to evaluate the current situation regarding pain and its management, including the provision of pain education and the perceptions of physicians and patients toward pain management. Adequate education for pain management may bolster confidence in prescribing complex therapies while cultivating improved pain assessment practices.

Patients and methods

Physician and patient populations

This cross-sectional study recruited physicians working in radiotherapy departments and patients undergoing radiotherapy in 10 tertiary Class A hospitals across the Shandong Province, China and surveyed them in the form of a face-to-face interview between March 2016 and April 2016. All physicians and patients participating in the survey were guaranteed confidentiality. A questionnaire-based survey was conducted by a global medical marketing research company, IPSOS, which was commissioned by the Tumour Radiotherapy Branch of Shandong Medical Association. The assessment of pain refers to the National Comprehensive Cancer Network (NCCN) Adult Cancer Pain Guideline.²² Surveyors were also required to conform to all the national laws while ensuring that the rights of all respondents were respected and data were not used for any unauthorized purposes. The study was coordinated by the Department of Radiotherapy, Qilu

Hospital of Shandong University, Jinan, Shandong Province, China.

This study was approved by the Ethical Committee of Qilu Hospital of Shandong University, Jinan, Shandong Province, China (no. KYLL-2016-501). Written informed consent from the physicians and patients were obtained following initial contact in which a description of this survey was provided.

Study methods

Physicians working in radiotherapy departments that day were selected and data were collected retrospectively using questionnaires. The selection process was not random. Patients were recruited from outpatient departments, those who were hospitalized and patients being treated in the radiotherapy departments visiting as day cases for treatment. The inclusion criteria for patients were as follows: (i) ≥ 18 years; (ii) conscious and oriented to people and place; (iii) able to communicate in Chinese. Exclusion criteria were as follows: (i) patients with pain caused by primary brain tumours or brain metastases; (ii) those who experienced pain unrelated to cancer.

The survey was undertaken as face-to-face meetings with physicians and patients using the designed questionnaires. All of the physicians and patients who participated in this cross-sectional study reported on the parameters via a questionnaire. The parameters covered included the diagnosis in patients, the duration of the waiting period before radiotherapy commencement, and the proportion of patients that experienced pain and the pain intensity during the waiting and radiotherapy periods, the physician's perceived attitude toward pain, the situation with regard to using analgesics and the analgesic effect. The estimated percentages of their patients that experienced pain during the waiting period and

radiotherapy period were provided by each physician and the mean percentage from all of the physicians was calculated for each period. Each physician estimated the percentage of their patients with pain that were treated with analgesia and the mean percentage from all of the physicians was calculated. In addition, questions for the physicians were specifically related to demographic data (i.e. years in clinical practice, department). Questions for patients specifically focused on the type of patient, the change of pain intensity between the waiting period and the radiotherapy period, and the proportion of patients who experienced different frequencies of communication with their physicians. The questionnaires that were used during the current study are available from the corresponding author on reasonable request. The radiotherapy waiting period was defined as the period from the development of a radiotherapy protocol to the start of radiotherapy. The radiotherapy period was defined as the period from the start of radiotherapy to the end of radiotherapy.

Statistical analyses

All statistical analyses were performed using the SPSS® statistical package, version 16.0 (SPSS Inc., Chicago, IL, USA) for Windows®. Continuous clinical and demographic data are presented by mean \pm SD and categorical data as n (%). Comparisons of clinical characteristics between physicians and patients were undertaken using χ^2 -test for categorical variables. A P -value < 0.05 was considered statistically significant.

Results

A total of 961 patients were screened and 636 agreed to participate. The flow diagram of the patient selection process is presented

in Figure 1. A total of 525 patients were in either the waiting period or the radiotherapy period, but 111 patients were rejected for not meeting the inclusion criteria. A total of 438 eligible patients were in the waiting period ($n = 237$) or undergoing radiotherapy ($n = 201$). The 201 patients who were in the radiotherapy period had also experienced a waiting period prior to commencement of their radiotherapy. Of the 438 eligible patients, 222 did not experience CP and 216 did experience CP. Among the 216 patients that experienced CP, 32 patients were not able to recall enough details, so a total of 184 patients who experienced pain and received treatment were included in the survey. A total of 87 physicians from oncology departments or radiotherapy departments were also recruited for this survey. The demographic characteristics of the physicians and the patient type

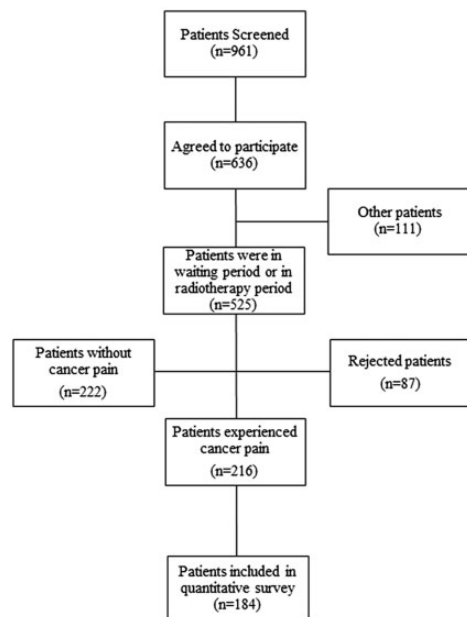


Figure 1. Flow diagram showing patient numbers at various stages in this cross-sectional survey of the current situation regarding the prevalence and management of pain in patients undergoing radiotherapy in Shandong Province, China.

are shown in Tables 1 and 2, respectively. The patients suffered from various types of cancers (Figure 2). Lung cancer (37 of 184 patients; 20.1%) was the most common cancer, followed by oesophageal cancer (31 of 184 patients; 16.8%) and breast cancer (26 of 184 patients; 14.1%).

Physicians and patients were required to recall how long the waiting period had been before radiotherapy. As shown in Figure 3, the patients experienced three different waiting periods before radiotherapy commenced (1–2 days, 3–5 days and 6–10 days), but there were no significant differences in the waiting time reported by

Table 1. Demographic characteristics of physicians ($n = 87$) that participated in this cross-sectional survey of the current situation regarding the prevalence and management of pain in patients undergoing radiotherapy in Shandong Province, China.

Parameter	n (%)
Sex	
Male	44 (50.6)
Female	43 (49.4)
Years in clinical practice	
1–3	19 (21.8)
3–5	12 (13.8)
5–10	23 (26.4)
>10	33 (37.9)
Department	
Oncology	14 (16.1)
Radiotherapy	73 (83.9)

Table 2. Type of patient ($n = 184$) that participated in this cross-sectional survey of the current situation regarding the prevalence and management of pain in patients undergoing radiotherapy in Shandong Province, China.

Parameter	n (%)
Type of patient	
Outpatient	10 (5.4)
Inpatient	119 (64.7)
Radiotherapy accelerator	55 (29.9)

physicians and patients. During the waiting period, pain was reported by the physicians according to their experience to affect 26.0% of patients, which almost agreed with the patients' data (36.5%; 160 of 438). However, there was a significant difference in the reported prevalence of pain during the radiotherapy period between the physicians' data (23.0%) based on their experience and the patients' data (84.1%; 169 of 201 patients; $P < 0.001$) (Figure 4a).

Of the enrolled 184 patients with CP who underwent treatment, 157 patients were in the waiting period and 148 cases were in the radiotherapy period. A total of 80 of 87 (92.0%) physicians said that they took the initiative to assess the pain status of their patients, including pain intensity, duration and character. However, patients (75.0%; 138 of 184 patients) said pain was assessed by physicians only when they informed the physician that they were experiencing pain. When patients did not proactively report pain to their physicians, only 7.1% (one of 14 patients) in the waiting period and 17.4% (four of 23 patients) in the radiotherapy period were assessed by their physicians proactively. The patients' self-assessment of pain intensity is shown in Figure 4b. A total of 61 of 184 patients (33.2%) reported that they had pain during the waiting period and the radiotherapy period. As shown in Table 3, 9.5% (two of 21 patients) of patients with mild pain experienced increased pain intensity during the radiotherapy period. Moderate pain was alleviated in 36.0% (nine of 25 patients) of patients during the radiotherapy period and nearly half of patients (46.7%; seven of 15 patients) with severe pain had their pain alleviated during the radiotherapy period.

Based on their experience, physicians said that 75.0% patients with pain were treated with analgesia. The majority of physicians (90.8%; 79 of 87) were satisfied with the analgesic effect and the rest of the

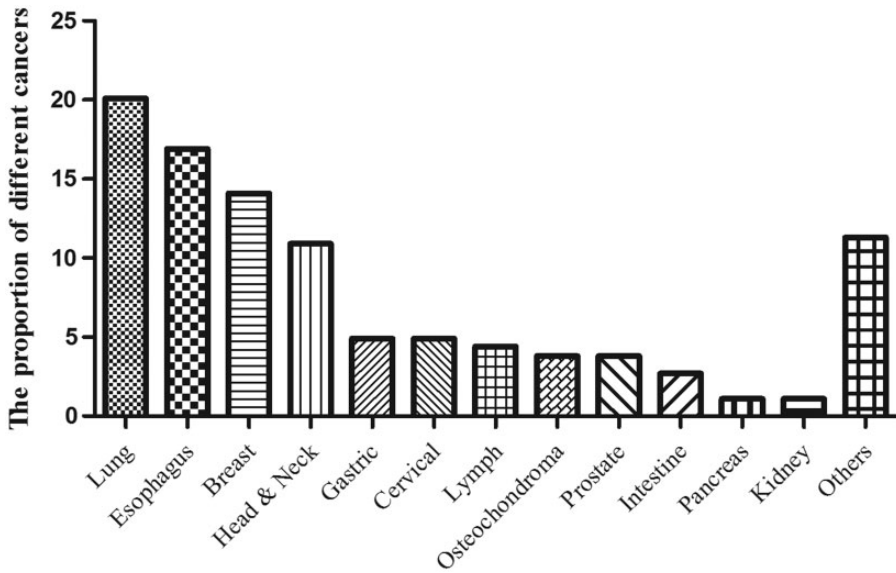


Figure 2. Proportion of different diagnosed cancers in patients ($n = 184$) that participated in this cross-sectional survey of the current situation regarding the prevalence and management of pain in patients undergoing radiotherapy in Shandong Province, China.

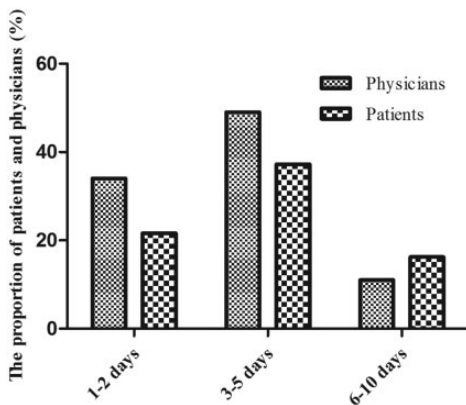


Figure 3. The duration of the waiting period before radiotherapy commencement as reported by the patients ($n = 184$) and the physicians ($n = 87$) in this cross-sectional survey of the current situation regarding the prevalence and management of pain in patients undergoing radiotherapy in Shandong Province, China. There were no significant between-group differences, $P \geq 0.05$; χ^2 -test.

physicians ($n = 8$) were quite satisfied with the analgesic effect. However, patients reported that 46.2% (85 of 184) of patients in the waiting period as well as in the radiotherapy period were treated with analgesia. During the waiting period, 69.9% (51 of 73), 6.8% (five of 73) and 4.1% (three of 73) of patients took strong opioids, weak opioids, and nonsteroidal anti-inflammatory drugs, respectively. During the radiotherapy period, strong opioids (71.0%; 49 of 69 patients) were mostly frequently used followed by weak opioids (8.7%; six of 69 patients). However, more than half of the patients reported experiencing inadequate analgesia in both periods (60.3% [44 of 73 patients] in the waiting period; and 52.2% [36 of 69 patients]) in the radiotherapy period. Regarding the choice of analgesics, WHO guidelines were considered as the primary reference by 90.8% (79 of 87) of physicians, while

6.9% (six of 87) of physicians selected an analgesic according to patients' responses. Most physicians (98.9%; 86 of 87) agreed that opioids should be taken as the first-line

therapy for pain management in cancer patients with moderate-to-severe pain; and only 1.1% (one of 87 physicians) was worried about addiction to opioid medication.

In this study, 60.5% (95 of 157) of patients learned about pain and pain management from their physicians, and 98.9% (94 of 95) through face-to-face counselling. The education included pain assessment, analgesia mode of action and analgesic selection. During the waiting period, the frequency of communication between patients and physicians was once in 6–15 days in 32.6% (31 of 95) of patients and 20.0% (19 of 95) of patients received once daily communication (Figure 5). During the

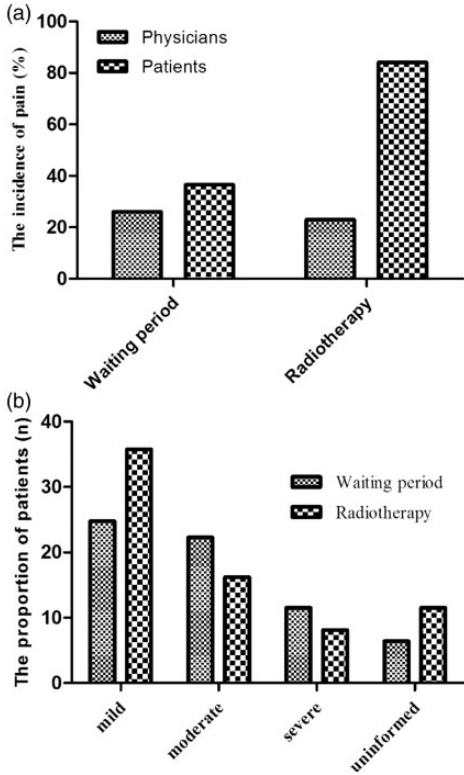


Figure 4. The proportion of patients that experienced pain during the two study periods as reported by the physicians and patients (a). The proportion of patients reporting different pain intensities during the two study periods (b).

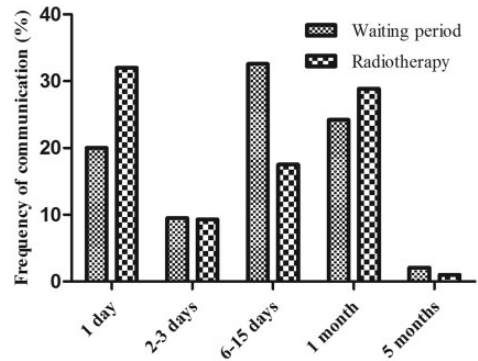


Figure 5. The proportion of patients who experienced different frequencies of communication with their physician during the two study periods. The frequency was recorded as one face-to-face communication session in the time period shown.

Table 3. The change of pain intensity of between the waiting period and the radiotherapy period of patients ($n = 61$) that participated in this cross-sectional survey of the current situation regarding the prevalence and management of pain in patients undergoing radiotherapy in Shandong Province, China.

Waiting period	<i>n</i> (%)	Radiotherapy period		
		Mild	Moderate	Severe
Mild	21 (34.4%)	19 (90.5%)	2 (9.5%)	–
Moderate	25 (41.0%)	9 (36.0%)	16 (64.0%)	–
Severe	15 (24.6%)	4 (26.7%)	3 (20.0%)	8 (53.3%)

Data presented as *n* of patients (%).

radiotherapy period, 32.0% (31 of 97) of patients received once daily communication, followed by once a month (28.9%; 28 of 97) and once in 6–15 days (17.5%; 17 of 97).

Discussion

Pain is a frequent symptom associated with cancer and its treatment. For example, pain prevalence rates were 39.3% after curative treatment, 55.0% during anti-cancer treatment, and 66.4% in advanced, metastatic or terminal disease.²³ Pain affects a person's health and mental well-being to such an extent that it leads to a decreased quality of life.⁵ Management of cancer pain is one of the key components in the comprehensive care of cancer and everyone has the right to access adequate pain management. Although there are effective therapies and evidence-based guidelines that have become available to treat pain in most cases, inadequate analgesia still exists.²¹ Research has identified barriers to the optimal management of pain; this includes inadequate assessment of pain by physicians, excessive regulation on opioid drugs, lack of education for patients on pain management and insufficient resources.²⁴ The present survey carried out in Shandong Province in China also revealed that there are many deficiencies in pain assessment, analgesia management and patient education, and that it is far below the physician's subjective estimation.

Nearly half of the physicians indicated that the waiting period lasts 3–5 days and 34% reported that it lasted 1–2 days; and there was no significant difference in the length of the waiting period reported by physicians and patients. A short waiting time cannot only promote the quality of treatment but also improves patient compliance and satisfaction, and a waiting time before radiotherapy of more than 5 days was regarded as unsatisfactory by

patients.²⁵ Thus, further efforts are needed to shorten the waiting period for radiotherapy to less than 5 days. Meanwhile, physicians should also pay attention to the pain management during the waiting period considering that over one-third of patients had pain during this period as shown in the current study.

Radiotherapy combined with analgesics is one of the most effective strategies in the treatment of CP.²⁶ According to WHO statistics, radiotherapy accounts for 18% of the cure rate of cancer and is second only to surgery (22%), which is one of the main treatment methods for CP.²⁷ Based on the results from this current study, patients with moderate or severe pain during the waiting period experienced some alleviation of their pain during the radiotherapy period. Nevertheless, physicians reported that the incidence of pain in patients was approximately 20% in the waiting and radiotherapy periods in the current study (Figure 4a), which was lower than the rates reported by the patient themselves, particularly in the radiotherapy period when the difference was significant ($P < 0.001$). Inadequate pain screening and assessment were considered as one of the reasons for this significant difference between the reporting of pain between the physicians and patients in the current study. The reasons were probably due to the lack of pain assessment tools and policies regarding routine assessment of pain, so the physicians did not proactively assess pain or did not pay close enough attention to radiation-induced pain. In addition, some patients did not take the initiative to inform their physician that they were experiencing pain during the course of the radiotherapy.

Many physicians only focus on whether patients have pain, seldom paying attention to the pain intensity.²⁸ Research has also demonstrated that a lack of knowledge has become an important obstacle for

physicians in terms of the implementation of pain management.²⁹ In addition, most patients consider pain to be inevitable; and there can be a psychological barrier resulting from worrying about drug addiction and side-effects.³⁰ Generally, pain assessment derives from the physician's experience and is not always consistent with the reality of patients. The lower pain incidence reported in this current study by physicians compared with the patients themselves might reflect the hesitancy of Chinese people to display pain in public.

In this current study, 90.8% (79 of 87) physicians chose analgesics according to the WHO guidelines and 98.9% (86 of 87) of physicians reported that opioids were most commonly used analgesics in clinical practice, while 1.1% of physicians were worried about addiction. It seems that most of the physicians that participated in the current study fully understood the use of analgesia for pain management. Only approximately 50% of patients with pain received analgesics; and among them, more than 50% of patients experienced inadequate analgesia. A previous meta-analysis of Western and Asian studies reported that the barriers to pain management in Asian patients were significantly higher than those for Western patients, especially in terms of side-effects of analgesics, the transfer of the physician's attention and the fear of addiction.¹⁷ A survey that was conducted on 5084 cancer patients in 11 countries showed that 77% of patients received analgesic treatment and 69% indicated that their daily life was affected by pain, although 50% of patients thought that their quality of life was not considered as a priority.³¹ The barriers for optimal pain management included the patient's fear of side-effects and addiction, the physician's inadequacy in terms of pain assessment and their reluctance to prescribe analgesia, the physician's attention to providing a pain management strategy and there seldom being any

mention of the patient's satisfaction with the analgesia provided.³² Furthermore, Chinese patients are more likely to be dependent on physician's prescriptions. Therefore, striking a balance between the physician's treatment and the patient's satisfaction may be a challenge for pain management.

A number of countries have undertaken pain management education programmes for cancer patients to improve their knowledge and their quality of life.⁵ A systematic review and meta-analysis of pain management on knowledge transfer reported that a knowledge translation intervention in pain management had a significant positive effect.³³ A study of 318 cancer patients found that professional nurse teaching based on motivation in relieving pain was significantly better than that of routine pain management education.³⁴ In this current study, more than 60% of patients received pain education through face-to-face counselling with their physician; and the most common frequency of delivery of education was once in 6–15 days (32.6%) during the waiting period. The results in this current study suggest that an investigation into the standardized assessment and treatment of cancer pain in Shandong Province will be required in the future in order to guide clinical practice and to strengthen pain management.

This current study had several limitations. Similar to many questionnaire-based surveys, the patient-reported outcomes may be associated with inevitable inaccuracies due to the possibilities of recall bias, which could have been caused by the poor recollection of clinical experiences or a misunderstanding the survey questions. Another limitation was the relatively small study population. In addition, only patients and physicians from Shandong Province were involved in this study. This may not truly reflect the national status of cancer pain assessment and management. In the

future, larger scale nationwide surveys will be carried out to clarify the situation further. Finally, the age and sex data for the patients were not collected in this survey, but these will be collected in any future research.

The current questionnaire-based survey among physicians and patients undergoing radiotherapy demonstrated a high rate of cancer pain, insufficient pain assessment, inadequate treatment of pain and insufficient education about pain management in the waiting and radiotherapy periods. Radiotherapy combined with analgesics especially strong opioids is essential for the management of pain in patients undergoing radiotherapy. Greater effort is still required to provide good pain management.

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Declaration of conflicting interest

The authors declare that there are no conflicts of interest.

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