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Cancer pain management in ambulatory care: can we link assessment and action to outcomes?

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Abstract

Purpose—Good cancer pain control requires appropriate assessment and treatment. The purpose of this study was to examine the relationships among physician, nurse practitioner, and nurse knowledge, documentation of assessment, treatment, and pain reduction in cancer patients seen in ambulatory settings.

Method—The study method included an assessment of pain knowledge of providers (physicians, nurse practitioners, and nurses) who worked in cancer clinics and a retrospective review of patients' records treated for cancer-related pain in their clinics. Fifty-eight providers from eight cancer clinics completed the knowledge questionnaire; 56 patient records were reviewed for assessment, treatment, and outcome data. Pain relief, the outcome, was obtained from documentation at the next clinic visit.

Results—Of the 54 patient records that documented pain relief at the next clinic visit, 61.9% reported no relief. Chi square analysis revealed clinics with a higher level of pain knowledge documented a greater number of elements of an ideal pain assessment ($p=0.03$) but was unrelated to treatment and pain relief reported. Assessment and treatment were unrelated to reported pain relief at the next clinic visit.

Conclusion—These data suggest that providers' pain knowledge is related to pain assessment but not treatment or outcome. In addition, these data showed no relationship between assessment, treatment prescribed, and pain relief in these ambulatory settings.

Keywords

Cancer pain management; Healthcare provider pain knowledge; Ambulatory settings; Cancer pain guideline

Providing good pain control for patients with cancer is a goal for healthcare providers, patients, and their families. Many factors contribute to adequate pain management. As expected, the patient and family/caregiver play a central role in pain outcomes. Because much of cancer care occurs in the ambulatory setting, the patient and/or their family/caregiver are the primary source of information regarding pain and pain-related issues. As such, they are responsible for communicating needed data to the healthcare providers. In addition, patients and their families/caregivers must be able to follow the treatment plan that has been developed for them [1]. Thus, patient and family/caregiver understanding of and agreement with the pain management plan are critical for adequate outcomes. Healthcare providers play an equally important role. They must be knowledgeable about cancer pain and its treatment and conduct appropriately timed assessments with review and modification of the treatment plan as needed. While patient-family/caregiver-related barriers have been extensively studied, many potentially important factors related to healthcare providers and pain outcome have not been thoroughly investigated. Furthermore, their inter-relationships have not been clearly delineated. The purpose of this study was to examine the relationships among provider (nurse, nurse practitioner, and physician) knowledge, the adequacy of documented assessments, the treatment plan, and pain reduction in cancer patients seen in ambulatory settings.

Review of literature

The prevalence of cancer pain varies across settings (i.e., inpatient and ambulatory) and countries. Portenoy [2] concluded that 50% of all patients with cancer experienced pain and the rate increased to >70% in patients' with advanced disease. In a more recent integrative review of 28 studies, Goudas et al. [3] reported rates from 14–100%. Cancer pain frequently has a continuous or basal level with periods of increased pain known as “breakthrough” pain. Breakthrough pain is commonly associated with higher levels of activity [4]. Studies that classified pain as basal or breakthrough found 45–100% of patients reported breakthrough pain [3]. It is clear from these studies that many patients with cancer experience pain at some time during their illness. Adequate treatment of cancer pain is important because of the effect of pain on daily activity [5,6], mood [7], and quality of life [8].

Guidelines have been developed to assist providers in assessing and treating cancer pain [9–11]. The American Pain Society Cancer Pain Guideline, a commonly cited and authoritative guide, recommends all cancer patients be screened for pain during each patient–provider encounter. If the patient reports new onset pain, a comprehensive assessment is completed. The components of an adequate assessment are clearly delineated within the guideline (Fig. 1). Analgesics, particularly opioids, are the mainstay of cancer pain treatment. The World Health Organization (WHO) analgesic ladder is embedded in the guidelines to provide recommendations for analgesic selection (nonopioid, weak opioid, and strong opioid) based upon level of pain (mild, moderate, and severe). Tests of the analgesic ladder suggest it can be effective in relieving pain for up to 90% of patients [12]. Despite the availability of these and other guidelines, cancer pain continues to be inadequately managed for many patients [6,13].

Several key components to adequate pain control have been identified. These include assessment and documentation. Assessment of pain is the first critical step in the therapeutic process. All assessments should be thoroughly documented. The medical record is a key communication tool that allows providers insight into the patient's pain issues including information regarding the current treatment plan. In recognition of the important role of these two processes, the Joint Commission for Accreditation of Healthcare Organizations added them as assessment and documentation requirements in 2001.

Unfortunately, there are no regulatory authorities to oversee the management of pain in the ambulatory setting. Thus, data about pain, pain assessment, and treatment within the ambulatory setting is less readily available. The available data indicate that pain documentation in the ambulatory setting is less than optimal [14,15]. For example, Rhodes et al. [15] found only 7% of medical records contained pain documentation in a community hospital cancer clinic. Most of these early studies involved paper records. Paper records have inherent limitations such as lost data and difficulty finding needed data. It often is assumed that use of the electronic medical record address some of these limitations thus improving documentation. Saigh et al. [16], however, found that including a mandatory pain assessment screen in their electronic documentation system led to a slight reduction (49–44%) in physician documentation of pain. They also identified a number of additional documentation issues. First, if physicians documented pain in the note, their assessment differed from the mandatory pain screen in 53% of cases. Second, the agreement between the pain reports in the same document by the same provider was less than 50%. Similar findings have been reported in a large sample of in- and out-patients [17] and patients with cancer seen in an ambulatory setting [18].

Interest in pain assessment is based on the presumption that it is a prerequisite for adequate pain control; however, this has not been consistently demonstrated. Trowbridge et al. [14] compared physician analgesic prescribing behavior in two cohorts of patients: (1) patients for whom they had been provided with information on pain, satisfaction, and relief in the medical record and (2) patients for whom this information was not provided. These investigators found a significant increase in analgesic prescription and lower pain intensity at 4-week follow-up when the physician had pain information available in the medical record. This trial suggests there is a direct relationship between availability of pain information and physician prescribing behaviors. Of note, there was no difference in adequacy of analgesics prescribed between the two groups as measured by the WHO analgesic ladder. Furthermore, a substantial number of patients in both groups (35–38%) failed to receive adequate analgesic prescriptions to manage their pain.

In addition to lack of adequate pain assessment and documentation, one factor that may contribute to inadequate pain control is a lack of provider knowledge. Ample evidence exists demonstrating physicians and nurses lack knowledge about pain, the use of opioids to control pain, and addiction [19]. Specific knowledge deficits have been found for equianalgesic dosing [8,20–22] and treating breakthrough pain [23,24]. Both of these are important when managing cancer pain. Education, both formal and continuing, does result in more accurate knowledge about cancer pain assessment and treatment [25]. This increased knowledge, however, has not been linked to improved patient outcomes, such as reduced pain intensity or reported pain relief.

In the current environment, healthcare providers are often overburdened with patient care issues. In the oncology setting, cancer treatment is often the primary concern of both the patient and the healthcare providers. Pain and other symptom control issues often are perceived as less important, thus they receive limited attention. This may be particularly true in patients with multiple complex medical issues that require ongoing attention.

In ambulatory settings, communication of the treatment plan to patients and their caregivers is critical as the patient and family caregiver are responsible for following the plan at home [1]. While few investigators have examined the routine instructions given to patients about the treatment plan, specifically how to use analgesics, more formal pain education programs have not demonstrated consistent improvement in patient outcomes [6,26].

It is clear that providing adequate cancer pain control is a complex activity requiring collaboration and communication among providers and between providers, patients, and their caregivers. In order to achieve desirable patient outcomes, such as reduction in pain intensity or pain relief, physicians, nurse practitioners, and nurses must have the knowledge necessary to assess and treat cancer pain. Thus, this study examined the relationships among physician, nurse practitioner, and nurse knowledge, documentation of assessment, treatment, and pain reduction in cancer patients seen in ambulatory settings. We hypothesized that: (1) increased knowledge results in increased assessment and (2) increased knowledge results in adequate treatment, as manifest by lower pain intensity reported at the next clinic visit.

Method

This study included an assessment of pain knowledge of providers (physicians, nurse practitioners, and nurses) who worked in cancer clinics and a retrospective review of patient records treated for cancer-related pain in the outpatient setting. These data were collected to determine current pain practice for a multi-center intervention study.

Setting and sample

Data were collected from eight cancer clinics in medical centers, community hospitals, and free-standing clinics in the southeastern USA. All attending physicians, nurse practitioners, and research nurses who worked with patients at the clinic were surveyed using a cancer pain knowledge questionnaire. Patient medical records were selected if they met the following criteria: (1) had been treated in the clinic within the past 2 years, (2) had a diagnosis of cancer, and (3) had an analgesic prescribed (opioid or non-opioid) for pain control. Once the record had been selected, two reviewers went back in the patient record to find (1) the first complaint of pain or (2) a note indicating a change or increase in the pain experienced. IRB approval was obtained prior to data collection.

Data collection materials

Cancer pain knowledge questionnaire—All providers completed a 20-item cancer pain questionnaire. Fourteen items reflected knowledge about cancer pain, addiction, equianalgesic dosing, and side effect management. One item addressed attitudes toward use of opioids, one item addressed the provider's degree of confidence in their pain knowledge, and four items requested demographic and clinical experience data. This survey was developed by a multidisciplinary team that included physicians, pharmacists, and nurses to assess provider knowledge. Previous use of the survey in the pharmacy revealed specific areas of knowledge deficit in this provider group.

Patient medical record review—The recommendations of the American Pain Society Cancer Pain Guideline [10] were the criteria used in the patient record review. According to the guideline, all patients should be screened for pain using a standard measure (e.g., numeric rating scale and verbal descriptor scale). If pain is present, a more thorough assessment is conducted. The guideline recommends a comprehensive pain assessment with the first complaint of pain or complaint of a new pain during the pain screen. This comprehensive assessment includes five elements (pain history, pain interference with activity, psychosocial issues, physical exam, and diagnostic evaluation). The six elements in

Fig. 1 were coded as present (1) or absent (0) and a total assessment score was calculated by summing the present items. Thus, the assessment score could range from 0 to 6. A cancer pain treatment score was generated by the analgesics prescribed (opioid and non-opioid) and the administration schedule (around the clock, p.r.n.). The optimal treatment regimen, following the WHO analgesic ladder, should include an analgesic with an around the clock schedule. For patients with moderate to severe cancer pain, the analgesic should be an opioid (preferably long-acting) with an immediate-release opioid prescribed p.r.n. for breakthrough pain. Analgesics prescribed were categorized as (1) no analgesic order documented (2) non-opioids alone, (3) immediate-release opioids p.r.n., and (4) immediate-release or long-acting opioids around the clock. To examine the patient-provider communication about the treatment plan, documentation of pain education (verbal or written) also was recorded. Many issues arise during a clinic visit that may be of higher priority than pain control; therefore, the number of problems addressed during the visit was recorded. Pain relief was examined in the next clinic visit note. Adequate pain relief was defined as a reduction in the pain score from the first to second clinic visit or documentation of pain relief in the follow-up note. The entire patient record was reviewed (problem list, history and physical, flow sheet, physician note, and medication record) and elements were coded as present regardless of where they were documented.

Statistical analyses

Data were analyzed using SPSS v 18. Descriptive statistics were used to describe the sample of providers and to summarize the data collected for each of the key study variables from patient medical records. Because each patient was not linked to a particular provider, but rather only to a particular clinical site, aggregate (median) levels of knowledge for each of the clinic sites based on the responses to the Cancer Pain Knowledge Questionnaire from providers within each site were generated and used for analyses. Because of the relatively small sample sizes, as well as skewed distributions, tests of differences between the groups of clinic sites (based on the aggregate provider knowledge scores) were conducted using Kruskal-Wallis tests. Associations between patient-level data were conducted using Spearman rank (r_s) correlations. A maximum alpha level of 0.05 was maintained for determining statistical significance.

Results

Description of providers

Fifty-eight providers from the eight cancer clinics completed the Cancer Pain Knowledge questionnaire. Of these, 32 were physicians and 26 were nurse practitioners or research nurses. Over three quarters of the sample had more than 10 years experience in oncology, and more than 70% of the sample had seen more than ten patients with pain in the past month (Table 1). Forty-six percent reported receiving education about pain management. Nine participants (16.1%) reported they had limited knowledge about pain; the remainder of the sample reported adequate or superior knowledge about pain. The sample, then, was experienced in managing cancer-related pain.

Cancer pain knowledge—The knowledge score was calculated as percent correct of the 14 knowledge items. Scores ranged from 50% to 100%, with a mean of 72.7 (median 71.4). Knowledge scores were not related to years of experience, number of patients seen with pain, or previous pain education. Physicians had higher knowledge scores than nurses, but this difference was not statistically significant ($p=0.07$).

Clinical sites—There was a statistically significant difference in the respective site provider knowledge scores ($p=0.04$). For analyses, these aggregate site knowledge scores

were collapsed into low (50–69% correct), moderate (70–74% correct), and high (75–100% correct). Sites with relatively low aggregate knowledge scores comprised 30.4% of the sample ($N=3$ with a total of 17 patients reviewed); sites with moderate knowledge scores comprised 42.9% of the sample ($N=3$ with a total of 24 patients reviewed); sites with relatively high aggregate pain knowledge comprised 26.8% of the sample ($N=2$ with a total of 15 patients reviewed).

Patient medical record review

Pain assessment documented—Patient records were selected regardless of the type and stage of cancer; the only requirement was that the patient received an analgesic for pain control. The majority of the 56 patients included in the review, however, had long-term disease with metastasis. A pain screen was documented in 25 patient records. Of the elements in the comprehensive pain assessment, physical exam was documented most frequently, and psychosocial issues the least (Table 2). The number of elements of pain assessment documented in each record ranged from 0 (19.6%) to 6 (7.1%).

Pain treatment prescribed—Patients were prescribed a number of analgesic combinations (Table 3). For purposes of analysis, the categories were collapsed into four levels of analgesic treatment: (1) no analgesic documented (28.6%), (2) non-opioids (7.1%), (3) immediate-release opioids p.r.n. (42.3%), and (4) immediate-release or long-acting opioids around the clock (21.4%). Only one patient record indicated that pain education had been provided.

Pain relief—The outcome, pain relief, was reviewed in the next clinic visit record. Median time between the initial visit and the follow-up was 20 days. There was no documentation of effectiveness of treatment in two patient records (3.6%). Of the remaining 54 patient records, 61.9% reported no relief and 38.9% reported pain relief.

Relationships among knowledge, assessment, treatment, and relief

A statistically significant difference was found among the three levels of clinic knowledge in the number of pain elements assessed ($p=0.031$). The clinics with higher provider knowledge scores documented a greater number of pain elements (median=4, min=0, and max=6) than the clinics with moderate (median=1, min=0, and max=4) and those with low aggregate provider knowledge (median=2, min=0, and max=4). No statistically significant differences among the aggregate knowledge scores were found between the types of treatment prescribed and between relief at the next visit. In addition, the number of pain elements assessed was not statistically significantly associated with pain relief at the next clinic visit, nor was a statistically significant relationship found between levels of analgesics prescribed and pain relief at the next clinic visit.

Relationship to patient problems addressed during clinic visit

The relationships between number of presenting problems and number of pain elements assessed ($r_s=0.21$) as well as between presenting problems and level of analgesics prescribed ($r_s=-0.07$) were weak and not statistically significant. Thus, the number of problems dealt with during a clinic visit did not appear to be associated with or interfere with the adequacy of pain assessment or treatment prescribed in this sample.

Discussion

The findings of this study reveal wide variation in provider knowledge about pain as well as behaviors related to pain documentation. Given the variability, it is not surprising that few relationships were found among the components of the pain control process. There was one

significant relationship between provider pain knowledge and completion of a comprehensive pain assessment. Although it is logical to assume that providers with better pain knowledge will conduct a more thorough pain assessment, this has not been explored in previous research. The lack of relationships among the other variables thought to be essential for good pain control may be related to several of the limitations of this study, specifically small sample size and inability to link providers to specific patient records.

The documentation of assessment and treatment of pain in these cancer clinics showed wide variation in completeness. These findings are consistent with previous research [14,15] regardless of whether electronic or paper records were used [16]. Of course, we cannot assume that the assessment or prescription of analgesics was not done if it was not documented. The discrepancy between provider actions and documentation was examined in emergency departments in two academic medical centers. Physicians were observed in their interactions with patients and the patient record was later reviewed for completeness. Of 209 physician-patient encounters observed, pain was assessed in 98% of encounters and documented in 91.7% of records. Medications were administered to control pain in 79% of the encounters but documented in only 31% of patient records [27]. Using self-report surveys and the electronic medical record, investigators found moderate agreement between patient-reported symptoms and documentation in all patients seen in the hospital and ambulatory clinics [17] and in the cancer clinic [18]. These studies indicate that documentation in the patient record does not reflect the content of the physician-patient encounter.

Pain relief was reported by 38.9% of patients (21/54) in this sample. Because of the small number of records where pain intensity was quantified, it is impossible to determine if the treatment prescribed was adequate for the pain level. In a recent systematic review, Deandrea and colleagues [28] found cancer pain was undertreated in 8% to 82% of patients. Our rate of inadequate pain relief falls within this range. Eight patients in this sample were receiving a long-acting opioid around the clock and an immediate-release opioid p.r.n. for breakthrough pain. According to the WHO analgesic ladder, this combination would be appropriate for severe pain. Even with this level of analgesics, 42% of this subgroup reported inadequate relief at the next clinic visit. An additional four patients received around the clock dosing of either a long-acting or immediate-release opioid. Two-thirds of patients with no analgesic documented reported inadequate relief, suggesting at least a portion of these patients were not receiving any analgesics. These data suggest that prescription of analgesics is less than ideal for some patients with cancer pain treated in the ambulatory setting.

Provider knowledge also revealed wide variability. In contrast to previous research [29], years of experience and degree of contact with cancer-related pain were not related to knowledge about cancer pain management. Knowledge of onset of action related to time of reassessment and goals for pain management was adequate in this sample. This may provide one explanation for the relationship found between provider knowledge and completeness of a comprehensive pain assessment. Two items addressed equianalgesic dosing, which has been identified as a specific knowledge deficit [20,24]. Physicians, nurse practitioners, and nurses in this sample demonstrated a good understanding of conversion from one route to another, but poor knowledge about conversion from one opioid to another. Consistent with a recent systematic review [19], knowledge of constipation, and addiction was poor. These findings suggest provider pain knowledge remains inadequate in terms of opioid conversion, side effects, and addiction.

Limitations

Several limitations should be noted. First, the use of existing data from patient records typically results in missing data. Patient records are used primarily for communication and to fulfill regulatory requirements, not to provide data for research. Documentation in paper charts and free-text notes is not standardized; information may be added or omitted based upon provider preference or institutional policy. While the use of patient records is a limitation of the study, this approach does provide a “snap shot” of usual documented care in a cost-effective manner. Although there was little standardization within and across clinics, consistency in coding was increased as one coder was consistent across all records reviewed. Thus the decision rules were applied consistently. The second limitation is the small sample size for both provider and patient groups, increasing the risk of a Type 1 error. The third limitation is that individual providers could not be linked to patient records. Because of this limitation, knowledge scores had to be collapsed within settings, further limiting the sample size.

Conclusion

This study sought to link providers' knowledge about cancer pain to behaviors thought to be essential to achieve adequate pain control. Data regarding these behaviors (i.e., assessment, treatment planning, and education) were obtained through patient records, which assume all action taken is documented. Documentation of a comprehensive pain assessment at the time of new or increased pain, treatments prescribed, and education of patient and family about the treatment plan, was highly variable. Of the knowledge and behavior variables measured, only provider knowledge was related to completion of a comprehensive pain assessment. This comprehensive pain assessment, however, was not related to treatment prescribed or patient-reported pain relief at the next clinic visit. Future prospective research is needed to more fully examine how the essential elements of good pain control are interrelated.

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- Pain intensity (using a standard instrument such as a numeric rating scale or a verbal descriptor scale)
- Degree to which pain interferes with normal activity
- Pain history
- Physical exam
- Psychosocial issues
- Appropriate diagnostic tests to determine etiology

Fig. 1.
Comprehensive pain assessment

Table 1

Provider characteristics

Variable	<i>n</i>	Percent
Type of provider		
Physician	32	55.2
Nurse	26	44.8
Years of oncology experience		
<2 years	2	3.4
2–5	4	6.9
6–10	7	10.1
10	45	77.6
Patients with pain in past month ^a		
0	4	7.1
1–5	5	8.9
6–10	5	8.9
10	42	75.0
Pain education ^a		
Yes	26	46.4
No	30	53.6

^aPercent based on total reporting

Table 2

Elements of pain assessment documented

Element	<i>n</i>	Percent
Pain screen	25	44.6
Pain history	18	32.1
Pain interference with activity	12	21.4
Psychosocial issues	8	14.3
Physical exam	34	60.7
Diagnostic tests	19	33.9

Table 3

Analgesics prescribed

Analgesic prescribed	<i>n</i>	Percent
Long-acting opioid a.t.c + IR p.r.n + non-opioid	1	1.8
Long-acting opioid a.t.c + IR p.r.n.	7	12.5
Long-acting opioid a.t.c	2	3.6
IR opioid a.t.c.	2	3.6
IR opioid p.r.n. + non-opioid	7	12.5
IR opioid p.r.n	17	30.4
Non-opioid only	4	7.1
No orders found	16	28.6