UNDERSTANDING OF CANCER RELATED PAIN: A CONTINUOUS EDUCATION REVIEW

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Abstract

Optimal pain management requires a systematic symptom assessment and appropriate management to promote quality of life. Inadequate management of pain is the result of various issues that include: under treatment by clinicians with insufficient knowledge of pain assessment and therapy; inappropriate concerns about opioid side effects and addiction; a tendency to give lower priority to symptom control than to disease management; patients under-reporting of pain and non-compliance with therapy. Thus, this paper will elaborate on all the above aspects, including the pathophysiology of pain, assessment and management of cancer pain; to understand the clinical approach used in managing cancer related pain. Cancer related pain remains the big problem now facing cancer patients, their family and oncology nurse specialists because of poor understanding, identification, assessment, and management. Despite the wide range of available pain management therapies, unfortunately, pain associated with cancer is frequently undertreated.

This paper may help nurses and post graduate oncology students in understanding the issue of cancer pain; in assessment, planning, and management of cancer related pain with consideration to all aspects of cancer pain in a comprehensive and systematic approach.

Key words: **cancer, cancer pain, pathology of pain, pain assessment, pain management, pain barriers, and nursing process.**

Introduction and Background

The International Association for the Study of Pain defines pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Pain is the most frightening symptom that is found in cancer patients and represents the most feared consequences for patients and their families (Cleeland, 2006).

Cancer related pain depends on type of cancer, stage of disease, type of treatment received and location of cancer (Laurie, 2012). Also, cancer patients experience multiple symptoms with pain; therefore, optimal pain management requires a systematic symptom assessment and appropriate management to promote quality of life (Meuser, Pietruck, Radbruch, et al. 2001).Inadequate management of pain is the result of various issues that include: under treatment by clinicians with insufficient knowledge of pain assessment and therapy; inappropriate concerns about opioid side effects and addiction; a tendency to give lower priority to symptom control than to disease management; patients under-reporting of pain and non-compliance with therapy (Portenoy & Lesage, 2002).Understanding all aspects of disease process, type of cancer, stage of cancer, effects of other treatments, and symptoms associated may help the nurses to overcome this issue (Portenoy & Lesage, 2002). Thus, this clinical log will elaborate on all the above aspects, including the pathophysiology of pain, assessment and management of cancer pain; to understand the clinical approach used in managing cancer related pain.

Cancer related pain remains the big problem now facing cancer patients, their family and oncology nurse specialists because of poor

understanding, identification, assessment, and management (Winslow, Seymour, & Clark, 2005). Despite the wide range of available pain management therapies, unfortunately, pain associated with cancer is frequently undertreated (Weiss, Emanuel, Fairclough, et al. 2001).

This paper may help nurses and post graduate oncology students in understanding the issue of cancer pain; in planning, assessment, and management of cancer related pain with consideration to all aspects of cancer pain in a comprehensive and systematic approach.

Moreover, it may help in raising some recommendations to stakeholders and administrative staff, which may help them in reshaping policies and guidelines related to cancer pain assessment and management in order to enhance the patient's quality of life. Thus, the purpose of this paper is review and it analyzes recent research articles that have studied cancer-related pain in order to understand the factors that affect cancer-related pain and to promote quality of life among cancer patients.

Theory Application

A multidimensional model of cancer pain includes five dimensions: physiologic (organic etiology of pain); sensory) intensity, location, quality); affective (depression, anxiety); cognitive (influences of pain on thought process, meaning of pain); and behavioral (behaviors used to express and/or control pain). McGuire (1987) confirmed these five dimensions and added a sixth dimension named a socio-cultural dimension; these dimensions will be used to better understand cancer pain. A multidimensional framework has implications for assessment and management of cancer pain. Thus, any clinical assessment must address relevant dimensions of pain. (Ahles, Blanchard, & Ruchdeschel, 1983)

Pain Experience among Cancer Patients

Cancer-related pain is still uncontrolled worldwide and has a significant spread. This review aimed to explore pain experience among cancer patients and to identify the relationship between the multidimensional aspects of cancer-related pain that need to be managed from a holistic perspective.

Despite advances in pain management, research studies confirmed inadequate pain management due to many factors such as poor assessment of pain by nurses and health care providers and not considering all dimensions of pain experience when planning for pain management (Alexopoulos, 2010).

A review of the available clinical literature regarding the experience of pain among cancer patients pointed to several factors such as cancer stage, bone metastasis, location of pain, and compliance to analgesic treatment, type of treatment, patient's beliefs about pain and the effects of personal characteristics. Also, the review focused on the interference of pain dimensions and their relatedness.

The physiologic dimension of the cancer-related pain experience involves the etiology of pain (i.e., bone metastases), the duration of the pain (i.e., acute or chronic), and the pattern of the pain (i.e., brief, momentary or transient, continuous, steady or constant) (McGuire, 1995).

The occurrence of pain may be associated with the patient's stage of disease (Stark, et al. 2012; Cohen, et al. 2005). Three of the 14 research studies on cancer pain described the physiological experience of pain. The studies that included some physiological variables (i.e., disease process, stage of disease, duration and pattern of pain) found that a large percentage of patients reported pain experience was the most distressing problem that was related to disease process, stage of cancer and metastases pattern. Pain was described as moderate to severe level on a numeric pain scale where 0 indicates no pain and 10 indicates worst pain.

Alexopulos, et al. (2010) used a descriptive cross-sectional design to describe the pain experience among 134 patients in advanced stage of cancer disease. Patients who were included in the study suffered from various malignancies. Most frequent malignancies were lung (35), and breast (25) cancers. Patients were given 35 item questionnaires to assess their response to pain and its influence with function and their compliance to analgesic treatment. Numeric pain scale was used to assess the intensity of pain. The result indicated that more than 70% perceived the intensity of pain as high or extremely high (scores 3 and 4), whereas 28% of the patients described the intensity of pain as moderate and low. Pain was predominantly located in the low back and spine (30%), followed by the abdominal (19%) and thoracic area (18%), lower extremities (11%) and pelvis (10%).

Also, the result indicated that pain influences the patient's physical and psychological functioning. Regarding compliance to analgesic treatments, non-compliance was observed in 15% of the patients, while 61% revealed negative attitudes and feelings toward the treatment; including the fear of side effects and fear of addiction. One important finding was 25% of patients reported not being informed about possible side effects of the analgesic treatment.

The findings from the above reviewed study confirmed that there is a relationship between sensory dimension (intensity of pain) and the physiological dimension such as stage of disease, duration and pattern of pain. Thus, nurses should consider this interrelatedness between these dimensions in planning for pain management and to consider education about analgesics and side effects to enhance compliance to treatment regimen.

The sensory dimension of cancer-related pain experience is composed of many variables such as intensity and location of pain. Two reviewed studies examined the pain intensity and its relation with other dimensions.

Vallerand, et al. (2007) conducted a cross-sectional study to examine the relationship between the sensory dimension (pain level) and patient's beliefs about pain. The researchers recruited 304 cancer patients, and identified two indicators to define the patient's beliefs regarding pain: knowledge of pain, and barriers to pain control. The researcher found that the patient's pain level was positively related to increased distress, and decreased perceived control over pain. It also confirmed a relation between pain level and functional status, and a direct effect between patient's beliefs of pain and the level of pain distress. Therefore, controlling the factors affecting pain level (perceived control, beliefs) may help in promoting quality of life.

These findings raised the importance of understanding patient's beliefs and the psychological aspect (patient's moods and anxiety level) in order to consider these aspects while planning for pain management.

The behavioral dimension of the cancer pain experience involves the patient's behaviors during pain to decrease pain or to indicate the presence of pain. Often these behaviors will increase as pain severity increases and will decrease as pain lessens. Three reviewed studies reported on the pain behaviors of patients with cancer.

Ngamkham, Janean, Holden, Diana, & Wilkie (2011) conducted a comparative, secondary data analysis. The researchers' recruited 762 outpatients with cancer who completed the numeric intensity pain scale (0-10) and the McGill pain questionnaire to measure pain location, quality and pattern. The researcher found that participants with continuous uncontrolled pain patterns reported behavioral effect on activity of daily living, communication, movement, fatigue, and emotion increased pain intensity whereas only movement increased pain intensity for participants with intermittent pain pattern. Similarly, Alexopoulos, et al. (2010) identified the location of pain and its relation with physical and psychological function. The pain location was reported to influence the patient's physical and psychological functioning. Specifically, 25% of the patients stated reduced physical activity, 12% loss of autonomy, 32% reported fatigue and generalized weakness, and 10% reported sleep disorders and 7% stated they would even prefer to die.

This finding reflects the effects of sensory and physical dimensions (pattern of pain, location of pain) on the behavioral and psychological dimensions of cancer pain that affect activity and ability to function. Thus, nurses need to consider these variables while assessing pain for appropriate management.

The socio-cultural dimension of the cancer pain experience is related to the demographic and ethnic characteristics associated with pain (e.g., age, gender, ethnicity, social support, and religious beliefs) as well as how pain affects personal, family, and social roles (McGuire, 1995). Four reviewed studies discussed the socio-cultural dimension. Culturally defined roles (e.g., gender roles) are important in the perceived meaning of cancer and its pain.

Meghani & Keane (2007) conducted a qualitative descriptive study to explore the preference of analgesic treatment for cancer pain among African Americans and the factors shaping these preferences. The researcher recruited 35 cancer patients from three outpatient oncology clinics. The data was gathered using demographics, the Brief Pain Inventory-Long Form, and in-depth semi structured interviews. The researcher reported that only 20% of the participants strongly believed in taking pain medications to decrease their pain, because they believed that attaining optimal pain relief was central to their sense of self-control and that pain medication helped them to communicate with others. The preference for analgesics for cancer pain was related to factors such as meaning of cancer pain treatment, past experience with pain relief and analgesic side effects, fears of dependency and tolerance, and past experience with providers and the health system.

Similarly, Im, Clark, & Chee, (2008) conducted a qualitative online forum designed from a feminist perspective and recruited 11 African American cancer patients who were recruited through both Internet and real settings. Nine online forum topics were used to administer the six-month online forum, and the data were analyzed using thematic analysis. Four themes emerged through the data analysis process. The researchers found that the participants look for pain as a challenge in life that they should fight against and differentiated it from ordinary pain because cancer was stigmatized in their culture. In addition, patients held varying beliefs about pain and pain treatments in particular; 41% of participants held strong beliefs about the potential for addiction to narcotics.

Furthermore, Cohen, et al. (2008) reported that patients, who have strong beliefs about the potential for addiction to narcotics, may influence their pain management. Effective pain management in the inpatient oncology setting continues to be an important clinical issue; there may be a significant relation between patients' beliefs about pain and pain management and the pain management they receive.

Assessment Tools

Poor assessments of cancer pain lead to ineffective control and management; assessment of pain should be evaluated at each clinical encounter and at regular intervals after initiation of pharmacologic or non-pharmacologic intervention.

Identifying the etiology of pain is important to its management and a multidimensional assessment of pain should be incorporated (Chung, Wong, Yang, 2000).

The goal of pain assessment is to identify the pathophysiology of the pain, intensity of the pain and its impact on the patient's ability to function.

For example, a study was done by Mystakidou, Tsilika, Parpa, et al. (2006) to evaluate the association between psychological distresses and pain with advanced cancer. Pain intensity and pain that affected walking ability, normal work, and relations with other people, as measured by the Brief Pain Inventory, were found to be significant predictors of anxiety, as measured by the Hospital Anxiety and Depression Scale. Using the same tools, the authors also found pain that interfered with enjoyment of life was a predictor of depression. There are many factors may play an important role in the response to analgesics and result in persistent pain such as changing nociception due to disease progression, intractable side effects, tolerance, neuropathic pain, and opioid metabolites (Mercadante & Portenoy, 2001).

Multiple pain assessment tools exist. Among the more commonly used tools are numeric rating scales, verbal rating scales, visual analog scales, and picture scales, but, still the main step of pain assessment is the patient self-report (Holen, Hjermstad, Loge, et al. 2006). The clinician should listen to the patient's descriptive words about the quality of the pain; these provide clues to its etiology. Moreover, the clinician should ask about the location of pain, radiation, changes in pattern; these may require a new diagnostic re-evaluation and modification of the treatment plan. In addition, exploring the cognitive aspects of pain may help in determining the degree of pain experience.

The Brief Pain Inventory (BPI) was developed from the Wisconsin Brief Pain Questionnaire (Daut, Cleeland, and Flanery, 1983). The BPI assesses pain severity and the degree of interference with function, using 0-10 NRS. It can be self-administered, given in a clinical interview, or even administered over the telephone. Most patients can complete the short version of the BPI in 2 or 3 minutes. Chronic pain usually varies throughout the day and night, and therefore the BPI asks the patient to rate their present pain intensity, pain now, and pain at its worst, least, and average over the last 24 hours. Location of pain on a body chart and characteristics of the pain are documented.

The BPI also asks the patient to rate how much pain interferes with seven aspects of life: (1) general activity, (2) walking, (3) normal work, (4) relations with other people, (5) mood, (6) sleep, and (7) enjoyment of life. The BPI asks the patient to rate the relief they feel from the current pain treatment (Wang & Cleeland, 2008).

Physical Examination

Physical examination should be done to determine the origin, characteristics, and intensity of pain. Altered sensation at the painful area may suggest neuropathic pain. All data collected during history taking and physical examination may help in diagnosis of pain with respect to etiology if the pain from the disease process or from the adverse effects of treatment such as chemotherapy or radiotherapy. Also, understanding pathophysiology may help in identifying if it is somatic, visceral, or neuropathic pain. Thus, comprehensive physical examination and assessment of other psychosocial and spiritual factors is very important in generating a comprehensive care plan for cancer pain management.

Diagnostic Procedure

To understand the cause of cancer pain the patients need to have various laboratory tests, X-rays, Computed Tomography (CT) scans, Magnetic Resonance Imaging (MRI) scans, Positron Emission Tomography (PET) scans or biopsies. Sometimes it can take weeks or months before the growth of a tumor shows up in an X-ray, for example, even though a patient has been complaining of pain all along. Every case is different, and depending on the type and stage of cancer, the appropriate diagnostic tests vary. After the pain is diagnosed and treatment initiated, it is essential to follow up specifically if the pain worsens or if there is any new pain. In this case, either the treatment will change and may need reassessment for another cause of the pain. The CT scan produces detailed, cross-sectional images of the body.

CT scans are helpful in staging cancer. They help in identifying if cancer metastasises to other organs. PET scans use glucose (a form of sugar) that contains a radioactive atom.

A special camera can detect the radioactivity. Cancer cells absorb a lot of the radioactive sugar because of their high rate of metabolism. PET is useful to look for cancer throughout the body.

Pathophysiology of Cancer Related Pain

Pain is sustained by different types of mechanisms. There is agreement among experts about the classification of pain into nociceptive, neuropathic, psychogenic, mixed, or idiopathic. This classification is found useful in assessment and therapeutic decision making.

Mechanisms of Nociceptive Pain

According to Willis (2007) nociceptive pain occurs as a result of the normal activation of the sensory system by noxious stimuli, a process that involves transduction, transmission, modulation and perception. Tissue injury activates afferent neurons (nociceptors) which have A-delta and C-fibers that respond to noxious stimuli and

are found in skin, muscle, joints and some visceral tissues. These fibers have specific receptors responsible for mechanical, chemical or thermal stimuli. Transduction is the process by which exposure to a sufficient stimulus produces depolarization of the peripheral nerve. Depolarization of the primary afferent nerve involves a complex neurochemistry, in which substances produced by tissues, inflammatory cells and the neuron itself influence transduction. Once depolarization occurs, transmission of information proceeds proximally along the axon to the spinal cord and then on to higher centers (Schaible, 2007; Stein, et al. 2009). The transmission of these neural signals is from the site of transduction (periphery) to the spinal cord and brain (Apkarian, Bushnell, Treede, & Zubieta, 2005).

The neurochemistry of these processes involves many compounds, including endorphins, neurokinins, prostaglandins, biogenic amines, GABA, neurotensin, cannabinoids, purines, and many others. The endorphinergic pain modulatory pathways are characterized by multiple endogenous ligands and different types of opioid receptors: mu, delta, and kappa. Endorphins are present in the periphery, on nerve endings, immune related cells and other tissues, and are widely distributed in the central nervous system (CNS). They are involved in many neuro-regulatory processes apart from pain control, including the stress response and motor control systems.

Opioid drugs mimic the action of endogenous opioid ligands. Most of the drugs used for pain are full mu receptor agonists. Other pain modulating systems, such as those that use monoamines (serotonin, norepinephrine and dopamine), histamine, acetylcholine, cannabinoids, growth factors and other compounds are targets for non-traditional analgesics, such as specific antidepressants and anticonvulsants (Apkarian, Bushnell, Treede, & Zubieta, 2005).

Nociceptive pain can be acute (short-lived) or chronic (long-lived), and may primarily involve injury to somatic or visceral tissues. Pain that is inferred to be related to ongoing activation of nociceptors that innervate somatic structures, such as bone, joint, muscle and connective tissues, is termed “somatic pain”. This pain is recognized by identification of lesion and characteristics that typically include a well localized site and an experience described as aching, squeezing, stabbing, or throbbing. Arthritis and metastatic bone pain are examples of somatic pain.

Pain arising from stimulation of afferent receptors in the viscera is referred to as visceral pain. Visceral pain is caused by obstruction of hollow viscous, is poorly localized and is often described as cramping and gnawing, with a daily pattern of varying intensity. When organ capsules or other structures such as myocardium, are involved however, the pain usually is well localized and described as sharp, stabbing or throbbing; descriptors similar to those associated with somatic pain (Apkarian, Bushnell, Treede, & Zubieta, 2005).

The neurogenic inflammation involves the release from nerve endings of compounds such as substance P, serotonin, histamine, acetylcholine, and bradykinin. These substances activate and sensitize other nociceptors. Prostaglandins produced by injured tissues also may enhance the nociceptive response to inflammation by lowering the threshold to noxious stimulation (Apkarian, Bushnell, Treede, & Zubieta, 2005).

Mechanisms of Neuropathic Pain

Neuropathic pain is due to direct injury or dysfunction of the peripheral or central nervous system. These changes may be caused by injury to either neural or non-neural tissues (Jarvis & Boyce-Rustay, 2009). The neuropathic pain is described as an uncomfortable sensation such as burning, shock-like or tingling (Truini & Cruccu, 2006). Injury to a peripheral nerve axon can result in abnormal nerve morphology. The damaged axon may grow multiple nerve sprouts, some of which form neuromas. The sensory nerve sprouts, including those forming neuromas, can generate spontaneous activity, which peaks in intensity several weeks after injury. These areas of increased sensitivity are associated with a change in sodium receptor concentration, and other molecular processes, and also can occur at sites of demyelination or nerve fiber injury not associated with the severing of axons (Jarvis & Boyce-Rustay, 2009). Some alterations in morphology and function result in peripheral sensitization, which may be related to a lower threshold for signaling or an expansion in receptive fields .In contrast to the still poor understanding of the mechanisms of peripherally generated neuropathic pain, there is almost no information about the processes that induce or sustain centrally generated pain syndromes. Function neuroimaging has demonstrated the extraordinary neuroplasticity of the brain in the setting of a neuropathic pain, such as phantom pain, but the mechanisms responsible are unknown (Bingel & Tracey, 2008).

Mechanisms of Psychological and Idiopathic Pain

The experience of persistent pain appears to induce disturbances in mood (reactive depression or anxiety), and impaired coping, which in turn, appears to worsen pain. This phenomenon is known generically as “psychogenic” pain and is subject to the specific diagnoses coded under the Somatoform Disorders in the Diagnostic and Statistical Manual of the American Psychiatric Association (American Psychiatric Association, 2000). It is very important that patients who have acute or persistent pain without a known physical source, not be inappropriately labeled. This may lead to inadequate assessment in the future and therapeutic decisions that are inappropriately skewed; unfortunately it also leads to stigmatization of the patient and

the potential for greater suffering. When reasonable inferences about the sustaining pathophysiology of a pain syndrome cannot be made, and there is no positive evidence that the etiology is psychiatric, it is best to label the pain as idiopathic.

Breakthrough pain, defined as transient exacerbation of pain after baseline pain, has been reduced to a mild or moderate level by treatment with opioids and occurs in about 63% of cancer patients. It has a rapid onset and a variable duration with an average of approximately half an hour. The presence of breakthrough pain is a marker of a generally more severe pain syndrome and is associated with both pain-related functional impairment and psychological distress.

Pain Management Strategies

There are two approaches used in cancer pain management; pharmacological approach and non- pharmacological approach. Prescribed pain medications are categorized as non-opioid, opioid and adjuvant pain medications. Non-opioid medications include acetaminophen and non-steroidal anti-inflammatory (NSAID) medications such as ibuprofen or naproxen sodium and are useful for mild to moderate pain and in conjunction with opioid medications for more intense pain (American Pain Society, 2005). The mechanism of action for acetaminophen is still unknown, but it is postulated that it has a central nervous system mechanism, because of its pain and fever reducing effects (Schug, 2005). In comparison, the mechanism of action of NSAIDs is well known. NSAIDs inhibit cyclooxygenase, an enzyme that catalyzes the production of prostaglandins, which are key instigators of the inflammatory process (American Pain Society, 2005). Because of this mechanism, NSAIDs are especially useful in treating inflammatory pain, as they prevent the very process that causes it (Samad, 2004).

Opioid pain medications are the medications most frequently used for moderate to severe pain because of their effectiveness, ease of titration, and favorable risk-to-benefit ratio (American Pain Society, 2005). Opioid medications include morphine, hydromorphone, methadone, codeine, oxycodone, hydrocodone, levorphanol, and fentanyl (American Pain Society, 2005). Opioid pain medications may be a combination of narcotic pain medications and acetaminophen or non-steroidal anti-inflammatory medications. Opioid medications act on opioid receptors which are found both peripherally and centrally in nerve tissue, in gastrointestinal, respiratory, and cardiovascular organs, and the bladder (Lipman & Gautier, 1997). One particularly opioid receptor-rich area in the central nervous system is the periaqueductal gray, which is a key area in the modulation or control of pain (Heinricher, 2005). When an opioid binds to the opioid receptor, an excitatory or inhibitory response occurs, which inhibits the transmission of pain impulses in the brain and spinal cord (Sweeney & Bruera, 2003).

The term adjuvant analgesics describes "…a non-opioid medication that has pain relieving effects in certain conditions, but whose primary or initial indication was not for the treatment of pain" (American Pain Society, 2005, p. 73). Medications that have been used as adjuvant pain medications include anticonvulsants and antidepressants (American Pain Society, 2005). Adjuvant medications diminish pain by altering nerve function. Anticonvulsants, such as phenytoin and carbamazepine work by blockading the sodium channels and stabilizing the nerve membrane (Kalso, 2005). Antidepressants, such as amitriptyline, increase the availability of neurotransmitters, block sodium channels, and block receptors (Kalso, 2005). When sodium channels are blocked the nerve depolarization and stimulation will be affected, and nerve hyper-excitability is diminished (Kalso, 2005).

The type of pain medication prescribed (i.e. non-opioid, opioid, adjuvant) is an important indicator of pain management quality as pain management guidelines recommend specific types of medication in response to different reports of pain (American Pain Society, 2005; NCCN, 2006; NCI, 2006). There are five essential concepts of the World Health Organization approach to drug therapy which are (1) oral administration, (2) by-the-clock, (3) by the ladder, (4) for the individual, and (5) with attention to detail. The drug is chosen to match the intensity of pain. A validation study of the World Health Organization Analgesic Ladder suggests that a direct move to the third step of the ladder is feasible and could reduce some pain scores but also requires careful management of side effects (Maltoni, et al 2005). Use of this approach enables management of 80% of cancer pain.

Radiation therapy can relieve pain associated with local extensions of cancer, as well as metastases. Pain due to peripheral nerve compression or infiltration by tumor may sometimes be relieved by radiation therapy. Radiation therapy may be simply palliative for relief of bone pain.

Non-pharmacological approaches

Non-pharmacological approaches such as Acupuncture, hypnosis, and biofeedback have been used for the relief of cancer pain and are useful in some cases. No adequately controlled studies have shown their effectiveness in cancer pain, but many ambulatory patients use these methods without the knowledge of their attending physicians. A systematic review of controlled clinical trials reveals that there is insufficient evidence to determine whether acupuncture is effective in treating cancer pain in adults (Paley, et al. 2011).

Drug delivery devices

Various drug delivery methods have been used to deliver opioid analgesics to the central nervous

system in cancer patients. For example, intrathecal by a programmable drug pump and catheter that are surgically placed underneath the skin of the abdomen. Because the medication is delivered directly to the pain pathway, small doses can be effective with intrathecal infusion. Site-specific drug delivery may also help to minimize side effects and limit addiction potential. Intrathecal drug delivery systems, which offer rapid and effective pain relief with less toxicity relative to oral or parenteral administration, are considered to be highly effective in a variety of settings (Stearns, et al. 2005).

Anesthetic Drugs

Various regional nerve blocks using local anesthetics can be used for pain relief. Local anesthetics and neurolytic agents can be delivered directly to the vicinity of the neural structures affected by tumor. Nerve blocks may be done as diagnostic procedures to predict the outcome of more permanent interventions such as neurolysis or rhizotomy.

Celiac plexus block for pancreatic cancer pain in adults can be performed by the percutaneous approach or guided by endoscopic ultrasonography. Although statistical evidence for the superiority of pain relief by celiac plexus block over analgesic therapy is minimal in a systematic review of clinical trials, it causes fewer adverse effects than opioids, which is important for patients (Arcidiacono, et al. 2011).

Neurolytic blocks of the sympathetic axis are considered important cost-effective adjuncts to pharmacologic therapy for the relief of severe visceral pain experienced by cancer patients. However, these blocks rarely eliminate cancer pain because of frequently coexisting somatic and neuropathic pain.

Surgical Methods of Cancer Pain Management

These methods are used in about 10% to 30% of cancer patients in whom other methods of pain control have failed. The aim is to reduce side effects of analgesic therapy and to improve the patient's quality of life. Surgical methods range from procedures to debulk tumors and decompress various pain sensitive structures to interrupting pain pathways. An example of some of these procedures includes spinal decompression and the insertion of a rod to stabilize the spine for bone pain due to metastatic involvement of the spine. Another example includes neuroablative procedures, such as dorsal rhizotomy, spinothalamictractotomy, and commissural myelotomy.

Spinal cord stimulation has been used successfully for treatment of intractable cancer pain. Spinal cord stimulation through implanted electrodes in a patient with intractable neuropathic pain due to metastatic cancer has been shown to provide 90% to 100% pain relief and discontinuation of pain medications for 1 year (Yakovlev & Ellias 2008).

Rehabilitation of the Patients with Cancer Pain

Adequate pain management is a requisite condition for successful rehabilitation of patients with cancer. Opioid pharmacotherapy, adjuvant drugs, disease-modifying therapies, and interventional strategies may be used concurrently to augment pain relief.

The current management of pain in cancer patients is inadequate and requires further research. Problems with management of cancer pain that need to be addressed include use of inadequate doses of opioids and poor management of opioid side effects (Jacobsen et al 2007). There is also a need to develop better dosing strategies and evidence-based recommendations for severe cancer pain. Currently, opioid dose titration for severe pain is guided by the experience and opinion of an individual expert. Evidence-based guidelines for the use of opioid analgesics in the treatment of cancer pain are being developed in Europe (Pigni, et al. 2010).

Evidence-based standards for cancer pain management have been described (Dy, et al. 2008). According to the recommendations, when spinal cord compression is suspected, providers should treat with corticosteroids and evaluate with whole-spine magnetic resonance imaging scan as soon as possible but within 24 hours to make further decisions for definitive treatment. With increasing length of survival of cancer patients, cancer pain is moving into the category of chronic pain and provides more challenges in management (Burton, et al. 2007). Although opioids are capable of controlling moderate and severe cancer pain, their adverse effects remain a cause for concern. Efforts to address this problem include the following (Plante & VanItallie, 2010). Neuro-stimulatory or neuro-inhibitive methods are being investigated to reduce the dose by amplifying the analgesic action of opioids. Search continues for endogenous opioids that are as effective as currently available opioids but without their adverse effects. Advances during the past decade suggest a future trend towards a targeted as well as an individualized plan of management of cancer pain that is appropriate throughout the course of illness (Portenoy, 2011).

Barriers to Effective Cancer Pain Management

Barriers to effective cancer pain management are still a permanent, feared, and prevalent problem throughout the world (Bagciva, Tosun, Komurcu, Akbayrak, and Ozet, 2009). Cancer related pain is prevalent in many types of cancer including 67-91% in the head and neck region, 56-94% in prostate, 30-90% in uterine, 58-90% in genitourinary and 40-89% in breast cancer (Valeberg, Rustoen, Bjordal, Hanestad, Paul, and Miaskowski, 2008.

There are many factors which contribute to ineffective pain management of cancer patients; they include barriers within systems of care, health care professionals, and

among patients and their families (Finley, Forgeron, & Arnaout, 2008).

Many researchers reported that patients are reluctant to report their pain for different reasons which include fear of side effects, fatalism about the possibility of achieving pain control, fear of distracting physicians from treating cancer, tolerance, addiction and belief that pain is indicative of a progressive disease (Potter, et al. 2003; Miaskowski, & Dibble, 1995; Finley, Forgeron, & Arnaout, 2008). Also, these factors cause a worse effect for all dimensions of a patient's quality of life and their families (National Institutes of Health, 2002). Major obstacles to patients reporting pain and using available analgesics include misconceptions regarding beliefs about disease and pain, and pain medication (Dawson et al., 2002; Gunnarsdottir, Donovan, Serlin, Voge, & Ward, 2002; Jacobsen et al., 2012).

To enhance the quality of cancer pain management, it is very important to better understand the phenomenon of patient-related barriers to cancer pain management. Also, investigating the patient-related barriers to cancer pain management will help to fill the gaps in knowledge related to patients' barriers and consequently enhance the quality of cancer pain management. Multiple factors associated with ineffective cancer pain management such as cultural factors, misperception about pain medication (fear of side effects, fear of addiction, and tolerance), patient's demographic characteristics and patient's beliefs such as fatalism which increases the suffering and reduced quality of life for patients and their families.

Many barriers to effective cancer pain management have been reported in order to establish clear guidelines and an educational program to overcome these barriers, to relief pain and suffering among cancer patients.

Summary and Conclusions

By understanding the factors that are involved in the dimensions of cancer-related pain from the patient's experience, nurses can better prevent problems and consequences of cancer related pain that lead to inadequate management of pain. Thus, understanding the experience of cancer related pain with consideration to sources, etiology of cancer pain, response to analgesic agents, and cultural beliefs should be a primary concern for nurses caring for patients with pain.

Nurses need to become sensitive to all aspects of experience of cancer related pain, and to pay particular attention to what happens when different aspects come together. Appropriate awareness and sensitivity to cultural influences is important in preventing discrepancies in pain assessment and management.

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