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Characteristics of pain in lung cancer patients

Akciğer kanserli hastalarda ağrının özellikleri

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Background: This study aims to evaluate characteristics of pain in primary lung cancer patients.

Methods: Between January 2004 and January 2009, data of 216 patients with primary lung cancer (184 males, 32 females, mean age 63 years; range 30 to 85 years) who were admitted to Gaziantep University, Faculty of Medicine, Algology Outpatient Clinic were retrospectively analyzed. The onset, localization and nature of cancer-related pain were evaluated.

Results: Pain was localized in the back, shoulders, upper abdomen, sacroiliac joint and legs. Pain originated from non-pulmonary metastasis in 154 patients (71.3%) and primary lung cancer in 62 patients (28.7%) in the study group. One hundred five (48.6%) patients had neuropathic pain, while 61 patients had visceral pain (28.2%). The mean onset of visceral and neuropathic pain was 2 and 12 weeks, respectively. Medical treatment was found to be effective in 68.5% patients. However, pain was controlled with central or peripheral block in addition to medical treatment in 31.5% patients.

Conclusion: Our study results showed that neuropathic pain was more frequent in the population and pain was controlled with medical or interventional methods in all patients.

Key words: Cancer; interventional methods; pain management; pulmonary.

Amaç: Bu çalışmada primer akciğer kanserli hastalarda ağrının özellikleri değerlendirildi.

Çalışma planı: Ocak 2004 - Ocak 2009 tarihleri arasında Gaziantep Üniversitesi Tıp Fakültesi Algoloji kliniğine başvuran 216 primer akciğer kanserli hastanın (184 erkek, 32 kadın; ort. yaş 63 yıl; dağılım 30-85 yıl) verileri retrospektif olarak değerlendirildi. Kanserle ilişkili ağrının başlangıcı, yeri ve doğası değerlendirildi.

Bulgular: Ağrı sırt, omuz, üst karın, sakroiliyak eklem ve bacaklarda yerleşmiş idi. Çalışma grubunda, ağrı 154 hastada (%71.3) akciğer dışı metastaz, 62 hastada (%28.7) ise akciğerdeki primer tümörden kaynaklanmakta idi. Yüz beş hastada (%48.6) nöropatik ağrı, 61 hastada (%28.2) ise viseral ağrı vardı. Viseral ve nöropatik ağrının ortalama başlama zamanı sırasıyla 2 ve 12 hafta idi. Tıbbi tedavi hastaların %68.5'de etkili bulundu. Ancak hastaların %31.5'de tıbbi tedaviye ek olarak santral ve periferik bloklar ile ağrı kontrol edildi.

Sonuç: Çalışma bulgularımız, nöropatik ağrının çalışma grubunda daha sık görüldüğünü ve ağrının tüm hastalarda tıbbi veya girişimsel yöntemler ile kontrol altına alındığını gösterdi.

Anahtar sözcükler: Kanser; girişimsel yöntemler; ağrı yönetimi; akciğer.

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The treatment of lung cancer necessitates a multidisciplinary approach. Pain is one of the most troublesome complaints of cancer patients; thus, pain control is crucial in the management of this disease.[1] Despite interventions, it is estimated that approximately 60% of cancer patients still suffer from pain due to either the cancer itself or the treatment procedures.[2-5] Furthermore, lung cancer is the leading cause of pain among cancer patients, with 40% developing severe pain during the course of the disease.[6-9] However, palliative care can provide improvement in pain levels.[10] Other common causes of pain include bone metastases, epidural spinal cord compression, and brachial plexopathy.[11]

In this study, we aimed to examine the causes of pain and its properties in our patients with primary lung cancer.

PATIENTS AND METHODS

The data from 216 primary lung cancer patients (184 males, 32 females; mean age of 63; range 30 to 85) who were admitted to the Gaziantep University Medical Faculty Algology clinic between January 2004 and January 2009 because of pain were evaluated retrospectively. Patients with cancer of an extrapulmonary origin were excluded from the study, and the university ethics committee gave their approval for it to be conducted.

Pain characteristics were evaluated with respect to localization, severity, and effectiveness of treatment methods. Information about the pain localization was obtained from the patient using a body diagram, and pain severity was evaluated using a visual analog scale (VAS), with 0 representing no pain and 10 indicating unbearable pain. In addition, information about the factors which might increase or decrease the pain were also evaluated, and these included the nature of the pain (neuropathic, visceral), its symptoms, sleep quality, the physical-social condition of the patient, appetite, concentration, and type of cancer treatment (e.g., operation, chemotherapy, or radiotherapy). We also obtained data regarding previously used medications and their effects on pain levels. The imaging modalities and blood parameters were recorded as well, and the lung cancer was staged according to the tumor, node, metastasis (TNM) classification.[12] Pain management was assessed according to the World Health Organization (WHO) Pain Relief Ladder as follows: step 1: non-opioid ± adjuvant; step 2: opioid for mild to moderate pain ± nonopioids ± adjuvant drugs; and step 3: opioid for moderate to severe pain ± nonopioids ± adjuvant drugs.[13] An increase in dosage was indicated if the patients had a VAS score of 3 or if they were receiving additional morphine subcutaneously three times a day. Controls were arranged every two weeks, and patients were informed that they would be admitted to the hospital if there were any problems.

A statistical analysis was performed using the MedCalc version 10.0.1.0 for Windows statistical software program (MedCalc Software, Ostend, Belgium), and a chi-square test was used for data evaluation. A p value of less than 0.05 was considered to be significant.

RESULTS

The clinical characteristics and treatment modalities of the patients are shown in Table 1. Neuropathic pain, visceral pain, or a combination of the two were described in 48.6% (n=105), 28.2% (n=61), and 23.2% (n=50) of the patients, respectively. The pain was localized in the back, shoulders, upper abdomen, sacroiliac joint, and legs, and it developed as a result of lung cancer metastasis in 71.3% of the patients (n=154) or the primary lung cancer itself in 28.7% (n=62). In addition, 90% had extrapulmonary metastases. Pain localization was determined via the body chart method, which is compatible with metastasis localization, and we determined that bone, brain, liver, abdominal lymph node, and adrenal gland metastases were present in 40.27% (n=87), 30.09% (n=65), 20.37% (n=44), 20.37% (n=44), 10.18% (n=22) of the patients, respectively.

The mean VAS pain score minimum-maximum was 6 (range 5-9) at admission, with the patients describing their pain as either severe or unbearable. The pain at the initial admission was generally reported as acute

Table 1. Clinical characteristics of the patients (n=216)

	n	%	Min.-max.
Cancer stage			
Stages 1 and 2	28	13.0	
Stage 3	61	28.2	
Stage 4	127	58.8	
Cancer treatment modality			
Radiotherapy	54	25.0	
Chemotherapy	49	22.6	
Chemotherapy + radiotherapy	52	20.0	
Surgery	61	28.1	
Visual analog scale		6	5-10
Pain treatment strategy			
WHO step treatment	148	68.5	
Invasive techniques	68	31.5	

Min.: Minimum; Max.: Maximum; WHO: World Health Organization.

Table 2. Distribution of patients according to the WHO step treatment (n=148)

Analgesic step	First control		Last control	
	n	%	n	%
Step 1	83	56.0	8	5.4
Step 2	54	36.5	78	52.7
Step 3	11	7.5	62	41.9

onset [2 weeks (range 1-5 weeks)] in patients with visceral pain, whereas it was 12 weeks (range 1 month to 2 years) in patients with neuropathic pain.

All patients had previously used non-opioids. Opioid analgesics (tramadol and fentanyl) along with adjuvant analgesics (amitriptyline, gabapentin, pregabalin, sertraline, and dexamethasone) were initiated according to the severity and character of the pain. Furthermore, all of the subjects had a depressive mood at admission; therefore, antidepressants were initiated as adjuvants [amitryptyline 22% (n=48), sertraline 17.1% (n=37), pregabalin 43.5% (n=94), gabapentin 3.2% (n=7), and dexamethasone 5.5% (n=12)] . We found that the number of patients receiving the step 1 treatment decreased over time while those receiving the step 3 treatment gradually increased (Table 2). In the end, improvement was achieved via the WHO step treatment in 68.5% (n=148) of patients. However, interventional techniques (central or peripheral blocks) were also performed in addition to the medical treatment in 31.5% (n=68) of the patients (Table 1), and an epidural catheter was inserted in 28 (41%) of 68 patients who received a nerve blockade. Chest/upper abdomen pain relief was achieved by an intercostal block in 20 patients, and shoulder pain necessitated a suprascapular block in 20 others. Furthermore, A lumbar catheter was inserted for 18 patients with lower extremity or back pain, and a thoracic epidural catheter was inserted for 10 others with thoracic pain (n=10). Additionally, a thoracic sympathetic block (n=15), lumbar dorsal root ganglion (DRG) pulse radiofrequency (RF) (n=15), a transforaminal epidural steroid injection (TESI) (n=16), a neurolytic celiac block, (n=10), and stellate ganglion lesion RF (n=8) were also performed. We also found that exposure to coughs and colds played a role in the increased pain of all of the patients while the pain due to bone metastasis increased with movement. For all of the patients in this study, pain was controlled with either medical or interventional methods. We also determined that 168 patients (77.7%) had constipation and 142 (65.7%) had nausea and vomiting at their initial admission, but respiratory depression, deep sedation, and drug dependence were not detected due to the use of opioids.

DISCUSSION

In this study we discovered that neuropathic pain was more prevalent in primary lung cancer patients. This type of pain can occur as a consequence of cancer chemotherapy.[14,15] Furthermore, according to a study by Lucas and Lipman,[16] neuropathic pain may develop in more than one-third of patients with cancer, and a meta-analysis by Potter and Higginson[17] that evaluated pain in lung cancer patients revealed that nociceptive pain was the major pathophysiological subtype in lung cancer pain. However, they also found that neuropathic pain accounted for 30% of the cases.[17] We detected more neuropathic pain (48.6%) in our study group, but this might be explained by the advanced cancer stages of our patients.

Lung cancer metastasis was a common cause of pain in our study, and the bones were the most common localization. A study by Kroenke et al.[18] that evaluated pain in cancer patients revealed that it was the leading presenting symptom of bone metastases. This pattern of pain was similar to what was found in primary bone tumors as it was intermittent and unrelated to physical activity in the beginning stages but became continuous and more severe within a few weeks.

We controlled the pain in our patients with sympathetic blocks, DRG pulse RF, and TESI when the step therapy in combination with the use of adjuvants was insufficient in the patients with osseous metastases. While the use of systemic therapies supported by analgesics is recommended, nerve blocks may be used for pain associated with this type of metastasis in conjunction with other treatment modalities.[19]

For most of our patients, pain management was achieved with the step 1 treatment. However, antidepressants were also given as adjuvants due to their secondary analgesic features. Pain and depression have been reported as the most common physical and psychological symptoms in patients suffering from cancer,[18] and the use of tricyclic antidepressants and anticonvulsants constitutes the first step in the treatment of neuropathic pain.[4,6,20]

The majority of our patients also suffered from constipation, but the numbers decreased with appropriate treatment. The common side effects of opioids, such as sedation, nausea, vomiting, and constipation, are dose-related; therefore, altering the patient's diet and prescribing laxatives on an as needed basis to prevent these adverse effects is important.[21]

An individual treatment plan for cancer pain must be planned for each patient[22] since different features related to their cancer (histology/stage) and pain response may be exhibited.[23,24] Pain control is achieved by regular follow-up strategies.[25] Orhan et al.[8] showed that most of their patients were satisfied with the WHO analgesic step treatment, but 12% of the patients in their study were treated via invasive techniques. Uncontrolled pain may necessitate alternative strategies, such as peripheral and/or central nerve blocks or neurolysis, which when used properly can increase the probability of pain relief.[18] The relatively high rate of invasive procedures in our study might be attributed to our more advanced lung cancer patient population.

Most of our patients were men, and this could be because of the higher rate of lung cancer among males than females. Simone et al.[3] reported that analgesic usage varied according to gender and treatment modality. However, other studies have reported no differences among genders with respect to pain scores or the frequency of analgesic usage.[26,27]

Pain was not evaluated objectively by von Frey device or quantative sensorial tests; therefore pain evaluation was consisted of subjective data with VAS.

Conclusion

We determined that the patient's pain in our retrospective study mainly occurred as the result of lung cancer metastasis, and it was predominantly neuropathic in nature. However, by implementing a regular follow-up strategy, the pain stemming from primary lung cancer was brought under control. However, further studies are needed on this topic to verify our data.

Declaration of conflicting interests

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