Effects of Metastasis on Pain Treatment in Patients with Cancer-Related Pain: A Retrospective Study

Yücel Zülfi Kurşun¹, Fuat Yıldız², Ömer Kaymaz³, Selami Ateş Önal⁴

¹*Clinic of Anaesthesiology and Reanimation, Bingöl State Hospital, Bingöl, Turkey*

²*Clinic of Anaesthesiology and Reanimation, Harput State Hospital, Elazığ, Turkey*

³*Clinic of Anaesthesiology and Reanimation, Kovancılar State Hospital, Elazığ, Turkey*

⁴*Department of Anaesthesiology and Reanimation, Field of Algology, Faculty of Medicine, Firat University, Elazığ, Turkey*

Objective: The goal of this study was to investigate the effect of the presence of metastases on pain treatment in patients with cancer-related pain.

Methods: Of the 1736 patients who were treated in Firat University, Faculty of Medicine, Department of Anaesthesiology and Reanimation, Algology Section, for cancer-related pain between January 1997 and December 2010, 1467 with complete medical records were evaluated. Patients were grouped as having no metastasis (Group I), a single organ metastasis (Group II), or multiple organ metastasis (Group III).

Results: There was no difference between the groups with regard to age. Visual Analog Pain (VAS) scores at admission were higher in Group III compared to the other groups, and significantly higher in Group I than in Group II. Analgesic ladder treatment was given to 85.5% of patients, and 14.5% were treated using additional minimally invasive analgesic intervention (MIAI) methods. In Group II and Group III, the rates of treatment in Step I and II were lower compared to Group I, while the rates of treatment in Step III were higher. Implementation of MIAI was higher in Group III than in the other groups, and higher in Group II than in Group I.

Conclusion: The presence of metastases causes more severe pain, which becomes more difficult to treat, and increases the analgesia step and the consumption of opioids in patients with cancer-related pain.

Key Words: Cancer, pain, metastasis, analgesics

Introduction

For many patients and their families diagnosed with cancer, probability of suffering from pain is the third leading feared feature of cancer after probability of incurability and death (1).

Cancer-related pain may occur with nociceptive or neuropathic mechanism and may appear as serious cancer-related pain syndrome. It may display psychiatric progression including psychological and behavioural disorders. Moreover, cancer-related pain may appear due to pre-existing chronic pain problem that resulted from tumour metastasis and cancer treatment (2, 3). In the subjects with metastasis, complications such as increase in the number of involved areas, metastasis-related neurological disorders, and vertebra fractures lead to extensive pain syndrome and increase in the intensity of pain (4).

There are various therapeutic options in the treatment of cancer-related pain. The widely accepted principle recommended by the World Health Organization (WHO) is to follow the "Analgesic Stepwise Treatment" protocol within the frame of Cancer-Related Pain Treatment Program (5, 6).

It has been stated that pain control is achieved with appropriate pharmacological therapy in more than 80%-85% of cancer patients and with invasive methods in the remaining in case stepwise system is accurately implemented. Thus, the goal of "none of the cancer patients should live or die with uncontrollable pain" can be achieved (6-9).

The present study aimed to investigate the effect of metastasis on pain treatment in oncology patients followed-up and treated for cancer-related pain.

Methods

The present study was approved by the Ethics Committee for Human Researches of Firat University Medical Faculty (Date: 10.03.2011, No: 75). The follow-up and treatment files of 1,736 patients, who presented to the Algology Section of the Anaesthesiology and Reanimation Department of Firat University Medical Faculty between January 1997 and December 2010 for malignancy-related pain, were reviewed. Considering patient privacy, consents were obtained from the patients in order that their records could be used in the study. After excluding 269 patients due to missing data, a total of 1,467 patients were included in the study.

The patients were divided into three groups according to the metastasis.

Groups

Group I: Patients without metastasis,

Group II: Patients with a single organ metastasis,

Group III: Patients with multi-organ metastasis.

Number of patients in the groups, their mean ages, genders, diagnoses, and scores of visual analogue scale (VAS) at the time of admission were reviewed. Distribution of the patients and distribution of minimally invasive analgesic intervention (MIAI) techniques according to the analgesia steps at the moment that the VAS score was 4 or less were evaluated.

Statistical analysis

Statistical analyses were performed using the SPSS version 12.0 program. One way analysis of variance was used for the

analysis of numerical data (age, presenting VAS score). Analysis of non-numerical data was performed using chi-square test. The difference between the groups was determined using Tukey HSD test as the Post-Hoc test. A $p < 0.05$ was considered significant for all analyses.

Results

The study patients ($n=1467$) were divided into three groups as patients without metastasis (Group I), patients with a single-organ metastasis (Group 2), and patients with multi-organ metastasis (Group 3).

Comparing the groups in terms of demographic data, no significant difference was found between three groups regarding their ages. When the study groups were compared in terms of presenting VAS scores, VAS scores were significantly higher in the Groups 2 and 3 as compared to the Group 1 ($p < 0.001$). VAS score of the Group 3 was also significantly higher than that of the Group 2 ($p < 0.001$) (Table 1).

With regard to gender distribution among patients, the number of males was higher in each of three groups. Comparing the groups in terms of gender, no significant difference was found (Table 2).

With regard to the distribution of the patients in the Group I according to the diagnoses, the leading diagnosis was lung cancer with a rate of 25.8% followed by gastric cancer with a rate of 9.9%. In the Group II, the leading diagnosis was again lung cancer with a rate of 17.5% followed by prostate cancer with a rate of 12.3%. In the Group III, the leading diagnosis was lung cancer with a rate 18.5% followed by gastric cancer with a rate of 11.5% (Table 3).

When the groups were compared in terms of the steps of analgesic therapy, the first and second step treatments performed in the Groups II and III were found to be significantly lower as compared to the Group I ($p < 0.001$). The third step, first step+MIAI, second step+MIAI, and third step+MIAI treatments performed in the Groups II and III were found to be significantly higher than those in the Group I ($p < 0.001$). The first and second step treatments performed in the Group III were found to be significantly lower as compared to those in the Group III ($p < 0.001$). The third step and third step+MIAI treatments performed in the Group III were found to be statistically significantly higher than those in the Group II ($p < 0.001$) (Table 4).

When the study groups were compared according to the MIAI, the rates of MIAI in the Groups II and III were signifi-

Table 1. Distribution of age and presenting VAS score among groups (mean $\pm$ SD)

Groups	Presenting VAS score	Age (year)
Group I (n=605)	6.0959 $\pm$ 0.03	61.3950 $\pm$ 1.25
Group II (n=576)	7.7639 $\pm$ 0.04 ^{a*}	60.3663 $\pm$ 0.61
Group III (n=286)	8.0245 $\pm$ 0.03 ^{ab*}	58.7552 $\pm$ 0.86

^aSignificant difference as compared to Group I, ^bSignificant difference as compared to Group II, * $p < 0.001$
Presenting VAS score: VAS score at the time of admission to the hospital

Table 2. Distribution of genders among groups % (n)

Gender	Group I (n=605)		Group II (n=576)		Group III (n=286)		Total (n=1467)
	Intragroup	Total	Intragroup	Total	Intragroup	Total	
Male	61.8% (374)	25.5%	61.8% (356)	24.3%	61.5% (176)	12.0%	61.8% (906)
Female	32.8% (231)	15.7%	32.8% (220)	15.0	38.5% (110)	7.5%	38.2% (561)

Table 3. Distribution of patients according to the diagnosis

Primer Malignite	Group I				Group II				Group III				Total			
	Patient number	Intra group	Inter group	Total	Patient number	Intra group	Inter group	Total	Patient number	Intra group	Inter group	Total	Intra group	Grup group	Inter group	Total
Head	20	3.3%	64.5%	1.4%	9	1.6%	29.0%	0.6%	2	0.7%	6.5%	0.1%	31	2.1%	100%	2.1%
Neck	29	4.8%	59.2%	0.7%	10	1.7%	20.4%	0.7%	10	3.5%	20.4%	0.7%	49	3.3%	100%	3.3%
Skin	16	2.6%	55.2%	1.1%	10	1.7%	34.5%	0.7%	3	1.0%	10.3%	0.2%	29	2.0%	100%	2.0%
Oesophagus	10	1.7%	55.6%	0.7%	6	1.0%	33.3%	0.4%	2	0.7%	11.1%	0.1%	18	1.2%	100%	1.2%
Gastric	60	9.9%	38.2%	4.1%	64	11.1%	40.8%	4.4%	33	11.5%	21.0%	2.2%	157	10.7%	100%	10.7%
Hepatobiliary	53	8.8%	57.6%	3.6%	30	5.2%	32.6%	2.0%	9	3.1%	9.8%	0.6%	92	6.3%	100%	6.3%
Pancreas	43	7.1%	32.8%	2.9%	65	11.3%	49.6%	4.4%	23	8.0%	17.6%	1.6%	131	8.9%	100%	8.9%
Colon	28	4.6%	40.0%	1.9%	28	4.9%	40.0%	1.9%	14	4.9%	20.0%	1.0%	70	4.8%	100%	4.8%
Rectum	15	2.5%	35.7%	1.0%	13	2.3%	31.0%	0.9%	14	4.9%	33.3%	1.0%	42	2.9%	100%	2.9%
Prostate	28	4.6%	24.1%	1.9%	71	12.3%	61.2%	4.8%	17	5.9%	14.7%	1.2%	116	7.9%	100%	7.9%
Bladder-Testis	20	3.3%	37.7%	1.4%	24	4.2%	45.3%	1.6%	9	3.1%	17.0%	0.6%	53	3.6%	100%	3.6%
Renal	5	0.8%	10.4%	0.3%	25	4.3%	52.1%	1.7%	18	6.3%	37.5%	1.2%	48	3.3%	100%	3.3%
U-C-O	21	3.5%	29.6%	1.4%	27	4.7%	38.0%	1.8%	23	8.0%	32.4%	1.6%	71	4.8%	100%	4.8%
Bone	28	4.6%	58.3%	1.9%	13	2.3%	27.1%	0.9%	7	2.4%	14.6%	0.5%	48	3.3%	100%	3.3%
Breast	29	4.8%	24.4%	2.0%	52	9.0%	47.3%	3.5%	29	10.1%	26.4%	2.0%	110	7.5%	100%	7.5%
Lungs	156	25.8%	50.3%	10.6%	101	17.5%	32.6%	6.9%	53	18.5%	17.1%	3.6%	310	21.1%	100%	21.1%
Lymph-Leuk	36	6.0%	62.0%	2.5%	17	3.0%	28.8%	1.2%	6	2.1%	10.2%	0.4%	59	4.0%	100%	4.0%
Other	8	1.3%	24.2%	0.5%	11	1.9%	33.3%	0.7%	14	4.9%	42.4%	1.0%	33	2.2%	100%	2.2%
Total	605	100%	41.2%	41.2%	576	100%	39.3%	39.3%	286	100%	19.5%	19.5%	1467	100%	100%	100%
U-C-O: Uterus-Cervix-Ovary, Lymph-Leuk: Lymphoma-Leukaemia																

Table 4. Distribution of stepwise treatment described by WHO among groups

WHO stepwise treatment	Group I (n=605)		Group II (n=576)		Group III (n=286)		Total (n=1467)	
	Patient Number	Intragroup	Patient number	Intragroup	Patient number	Intragroup	Patient number	Intragroup
1 st step	63	10.4%	13	2.3% ^{a*}	1	0.3% ^{ab*}	77	5.2%
2 nd step	414	68.4%	295	51.4% ^{a*}	135	47.2% ^{ab*}	844	57.6%
3 rd step	101	16.7%	151	26.2% ^{a*}	82	28.7% ^{ab*}	334	22.8%
1 st step + MIAI	2	0.3%	5	0.9% ^{a*}	3	1.0% ^{a*}	10	0.7%
2 nd step + MIAI	12	2.0%	44	7.5% ^{a*}	18	6.3% ^{a*}	74	5.0%
3 rd step + MIAI	13	2.1%	68	11.8% ^{a*}	47	16.4% ^{ab*}	128	8.7%
Total	605	100%	576	100%	286	100%	1467	100%
MIAI: Minimally Invasive Analgesic Intervention, ^a Significant difference as compared to Group I, ^b Significant difference as compared to Group II. *p<0.001								

Table 5. Minimally invasive analgesic intervention

Groups	Patient number	Intragroup	Total
Group I (n=605)	27	4.5%	1.8%
Group II (n=576)	117	20.3% ^{a*}	8.0%
Group III (n=286)	68	23.8% ^{ab*}	4.6%
Total (n=1467)	212	14.5%	14.5%
^a Significant difference as compared to the Group I, ^b Significant difference as compared to the Group II. *p<0.001			

cantly higher than the Group I (p<0.001). The rate of MIAI was significantly higher in the Group III compared to the Group II (p<0.001) (Table 5).

Pain treatment was provided by MIAI in 14.5% of the study patients. Distribution of MIAIs is demonstrated in Table 6.

When the groups were compared in terms of the type of MIAI, the rates of caudal epidural differential block, temporary epidural catheter implantation, permanent epidural port implementation after temporary epidural catheter, and celiac

plexus block were significantly higher in the Groups II and III as compared to those in the Group I ($p<0.001$).

The rate of temporary epidural catheter insertion and permanent epidural port implantation after temporary epidural catheter was significantly higher in the Group III than those in the Group II ($p<0.001$) (Table 7).

Since the number of splanchnic block, superior hypogastric block, ganglion impar block, sympathetic blockade of somatic configurations, and other minimally invasive interventions was low, intergroup comparisons of these interventions were disregarded. Other interventions included stellate ganglion block, pituitary ablation, trigeminal nerve block, femoral-sciatic block, and intercostal block.

Discussion

Cancer-related pain is a universal medical problem. It has been assumed that 150,000 new cancer patients would be

seen in Turkey each year (10). Pain appears as an important symptom in cancer patients with prevalence reported to be 30% in the patients with metastasis and 80% in the patients in advance stages. This rate may rise up to 90% in terminal stage. The number of patients suffering from severe cancer-related pain reported by WHO in 1985 was 3.3 million, of whom 2.5 million did not receive adequate treatment. It is suggested that the number of patients not receiving adequate treatment will be 4.5 million in 2015 if it continues to grow at the same rate (11, 12).

In the present study, patients ($n=1,467$) were divided into three groups as patients without metastasis, with a single organ metastasis, and with multi-organ metastasis. The number of patients in the groups, as well as their mean ages, genders, diagnoses, and presenting VAS scores were evaluated. Effects of metastasis on VAS scores, on the number of patients in stepwise treatment groups, and on the rate of MIAs were investigated.

The number of patients included in the study was 1,467. Group I consisted of 605 (41.2%) patients, Group II consisted of 576 (39.3%) patients, and Group III consisted of 286 (19.5%) patients.

Ventafriidda et al. (13), Karlı et al. (14), and Orhan et al. (15) conducted similar studies on 1,219, 133, and 475 cancer patients, respectively and they found the mean ages as 57.5 ± 8.4 , 57 ± 15.8 , and 55.9 ± 15.4 years, respectively.

In the present study, distribution of the mean ages among groups was as follows; 61.40 ± 1.25 years in the group without metastasis, 60.37 ± 0.61 years in the group with a single organ metastasis, and 58.76 ± 0.86 years in the group with multi-organ metastasis. There was no significant difference among the groups in terms of the mean age. The mean age of the present

Table 6. Distribution of minimally invasive analgesic interventions % (n)

Intervention	Patient number
Caudal Epidural Differential Block	1.1% (16)
Temporary Epidural Catheter Implantation	4.8% (70)
Temporary and Permanent Epidural Catheter Implantation	6.3% (93)
Celiac Plexus Block	1.2% (17)
Splanchnic Nerve Block	0.1% (2)
Hypogastric Plexus Block	0.1% (2)
Ganglion Impar Block	0.1% (2)
Sympathetic Blockade of Somatic Configurations	0.3% (4)
Other	0.4% (6)
Total	14.5% (212)

Table 7. Distribution of minimally invasive analgesic interventions among groups

Primary malignancy	Group I			Group II			Group III			Total		
	Patient number	Intragroup	Total	Patient number	Intragroup	Total	Patient number	Intragroup	Total	Patient number	Intragroup	Total
Caudal Ep. Dif. Block	4	0.7%	0.3%	8	1.4% ^{a*}	0.6%	4	1.4% ^{a*}	0.3%	16	1.1%	1.1%
Temporary Ep. Cat.	12	2.0%	0.8%	37	6.4% ^{a*}	0.7%	21	7.3% ^{ab*}	1.4%	70	4.8%	4.8%
Temporary Ep. Cat. and Permanent Ep. Port Cat.	9	1.5%	0.6%	51	8.9% ^{a*}	0.7%	33	11.5% ^{ab*}	2.2%	93	6.3%	6.3%
Celiac Plexus Block	2	0.3%	0.1%	11	1.9% ^{a*}	0.4%	4	1.4% ^{a*}	0.3%	17	1.2%	1.2%
Splanchnic Nerve Block	0	0.0%	0.0%	0	0.0%	4.4%	2	0.7%	0.1%	2	0.1%	0.1%
Hypogastric Plexus Block	0	0.0%	0.0%	2	0.3%	2.0%	0	0.0%	0.0%	2	0.1%	0.1%
Ganglion Impar Block	0	0.0%	0.0%	2	0.3%	4.4%	0	0.0%	0.0%	2	0.1%	0.1%
Symp. Blockade of Somatic Configurations	0	0.0%	0.0%	3	0.5%	1.9%	1	0.3%	0.1%	4	0.3%	0.3%
Other	0	0.0%	0.0%	3	0.5%	0.9%	3	1.0%	0.2%	6	0.4%	0.4%
Total	27	4.5%	1.8%	117	20.3%	7.8%	68	24.1%	4.7%	212	14.5%	14.5%

Ep. Dif.: Epidural Differential, Ep. Cat.: Epidural Catheter, Symp.: Sympathetic. ^aSignificant difference as compared to Group I, ^bSignificant difference as compared to Group II. * $p<0.001$

study participants was similar to that found in the studies from different countries and regions.

Increase in the number of involved areas and metastasis-related complications such as neurological impairment and vertebrae fractures cause extensive pain syndrome and, in addition, increase in the intensity of pain (4).

Afşar et al. (16) assessed pain and the coping methods with pain in 112 cancer patients of whom 47.9% had metastasis and reported that VAS scores were higher in the patients with metastasis.

In the present study, initial VAS scores of the patients in the Groups I, II, and III were 6.0959 ± 0.03 , 7.7639 ± 0.04 , and 8.0245 ± 0.03 , respectively. Presenting VAS scores were significantly higher in the Groups II and III as compared to the Group I. Presenting VAS score was significantly higher in the Group III than in the Group II. Data of the present study demonstrated that presence of metastasis and increase in metastasis enhanced pain intensity and this finding was similar with the study conducted by Afşar et al. (16).

In similar studies conducted by Ventafridda et al. (13), Orhan et al. (15), and Karşlı et al. (14) in cancer patients, male/female ratio in the patients with cancer-related pain was reported to be 62%/38%, 62.5%/37.5%, and 60.2%/39.8%, respectively. In the present study, the majority of the patients were male and male/female ratio was 61.8%/32.8% in Group I, 61.8%/32.8% in Group II, and 61.5%/38.5% in Group III. The male/female ratio in the entire study cohort was 61.8%/38.2%. No significant difference was found among three groups in terms of male/female ratio. Data were consistent with other studies.

Ventafridda et al. (13) conducted a study in cancer patients and reported that lung cancer ranked first with a rate of 23.3% and head-neck cancer ranked second with a rate of 19.6%. In another study, Orhan et al. (15) reported that cases with lung cancer ranked first with a rate of 19.36% whereas cases with uterus-cervix-ovary cancer ranked second with a rate of 10.0%. Likewise, Karşlı et al. (14) reported that lung cancer ranked first with a rate of 21% followed by prostate cancer with a rate of 17.4%. With regard to the distribution of patients among diagnoses in the present study, lung cancer was the leading (21.1%) followed by gastric cancer (10.7%). Lung cancer is the most prevalent cancer all over the world (10). In the present study as well, lung cancer ranked first. This result is consistent with the results of other studies.

Zech et al. (17) retrospectively evaluated the distribution of treatment methods of 2,117 cancer patients among stepwise treatment and reported that 11.1% of the patients were treated in the first step, 31.1% were treated in the second step, and 49% were treated in the third step. Orhan et al. (15) conducted a study in cancer patients and reported the

distribution of patients according to the stepwise treatment that 11.7% were treated in the first step, 73.79% were treated in the second step, and 14.42% were treated in the third step. In the present study, 5.2% of the patients were treated in the first step. With regard to the distribution of patients receiving the first step treatment among the study groups, Groups I, II, and III comprised 10.4%, 2.3%, and 0.3% of the patients, respectively. The chance of treatability with the first step treatment according to WHO stepwise approach is decreased as the organ metastasis is increased in patients with cancer-related pain. In the present study, 57.6% of the patients received the second step treatment. According to the distribution of the patients receiving the second step treatment among groups, 68.4% were in Group I, 51.4% were in Group II, and 47.2% were in Group III. Moreover, 22.8% of the patients received the third step treatment. It was observed that treatability only with the third step approach was increased as organ metastasis was increased in the patients with cancer-related pain. The number of patients treated with the second step approach in our clinic was higher since the majority of the patients that presented with pain had received the first step treatment in other clinics. As the consequence, the number of patients treated with the first step approach was low in each study groups.

The rate of receiving second step approach was reported to be 73.9% by Orhan et al. (15) and this was consistent with the result of present study. The rate of patients treated with this approach was higher in the present study as compared to the studies conducted by Zech et al. (17) (31%) and by Zimmerman et al. (18) (15%).

The rate of receiving third step treatment was reported to be 14.42% by Orhan et al. (15) and it was the closest results to that reported in the present study. This rate was reported to be 68% by Ventafridda et al. (13) and 49% by Zech et al. (17). The rate of receiving third step treatment was found to be lower in the present study as compared to these two studies. Likely reason for the difference in rates might be the usage of weak opioids at the highest possible dose for the patients receiving second step treatment in the present study. In our clinical practice, codeine has been used as weak opioid and is frequently used in combination with other drugs. In our clinic, codeine is being prescribed in combination with paracetamol and caffeine to be prepared in sachet form in the pharmacy. It is used at certain time intervals based on patient's need. Caffeine is a psychostimulant and enhances analgesic efficacy of codeine by increasing its absorption through gastric mucosa. Moreover, it is used as additional analgesic to reduce opioid-related sedation. Codeine-caffeine-paracetamol combination provides opportunity of using drugs at the highest dose depending on patient's need (19).

In case stepwise approach to analgesia treatment fails to control pain or causes adverse events, the patient should be referred to an Algologist to consider other pain-relief tech-

niques. However, serious and important complications may occur during invasive treatment. Thus, invasive interventions should be performed by experienced physicians in pain treatment departments and the patients should be monitored. Technically, simple nerve block requires only basic anatomical knowledge and technical skill; however, complex equipment is not a realistic alternative (6, 20).

In the present study, 85.5% of the patients were treated according to the stepwise approach to analgesia treatment. MIAI was performed in 14.5% of the patients, in whom adequate pain control could not be provided by stepwise approach. The rate of MIAI was increased as the metastasis was increased.

All patients should undergo temporary nerve block for 2 or 3 times before deciding to perform permanent nerve block (19, 21).

Karslı et al. (14) conducted their study in cancer patients and reported MIAI methods to be celiac/splanchnic block in 1.5%, ganglion impar block in 2.3%, stellate block in 0.8%, epidural port catheter implementation in 10.5%, spinal port catheter implementation in 1.5%, brachial plexus block in 2.3%, and intercostal block in 4.5% of the patients.

In the present study, prevalence of caudal epidural differential block was higher in Group 2 and Group 3 as compared to Group 1.

Presence of metastasis has enhanced the likelihood of performing caudal epidural differential block. In our clinic, caudal epidural differential block was performed in the patients without vertebrae metastasis, but with radiculopathy accompanying primary diagnosis and with disc-originated pain.

In our clinic, temporary epidural catheter is performed before permanent blocking and permanent epidural port catheter in order to assess whether patients would benefited from this procedure. In the present study, 4.8% of the patients underwent temporary epidural catheter implementation. The reason for such a high rate was the fact that patients refused to undergo subsequent MIAI. The rate of performing epidural catheter was significantly higher in the Groups II and III as compared to the Group I. Presence of metastasis and increase in metastasis enhanced the rate of temporary epidural catheter implementation.

In the present study, the rate of implementing permanent epidural port catheter following temporary epidural catheter was 6.3%. According to the distribution of permanent epidural port catheter implantation after temporary epidural catheter among groups, 1.5%, 8.9%, and 11.5% of the patients were in the Groups I, II, and III, respectively. The rate of inserting permanent epidural port catheter following temporary catheter was significantly higher in the Groups II and III as compared to the Group I. The rate of implementing perma-

nent epidural port catheter following temporary catheter was significantly higher in the Group III than in the Group II. Presence of metastasis and increase in metastasis enhanced the rate of implementing permanent epidural port catheter following temporary catheter.

Malignant tumours that arise from upper abdominal organs such as pancreas, stomach, duodenum, proximal small intestine, liver, and biliary tract, as well as compression by lymphadenopathies, may cause severe abdominal pain that is refractory to drug therapy or radiotherapy. Celiac plexus block is a good alternative in patients who have to receive high-dose analgesic and have no chance for surgical treatment. High incidence of adverse events due to high-dose opioids enhances the importance of celiac plexus block (22).

In the present study, celiac plexus block was performed in 1.2% of the patients. The rate of performing celiac plexus block was significantly higher in the Groups II and III as compared to the Group I. However, no significant difference was found between the Groups II and III. The results of the present study were consistent with the study conducted by Karslı et al. (14) in terms of celiac block and epidural port catheter implementation rates. In the present study, ganglion impar block, splanchnic block, upper hypogastric block, and sympathetic blockade of somatic configurations were disregarded since their number were low to make a statistical comparison among groups. Other blockades include stellate ganglion block, pituitary ablation, trigeminal nerve block, femoral-sciatic nerve block, and intercostal blockades and they were disregarded for the same reason.

Conclusion

It is observed that presence of metastasis enhances intensity of pain in patients with cancer-related pain. Intense pain makes pain treatment difficult. Thus, presence of metastasis in patients with cancer-related pain increases the step in stepwise approach to analgesia treatment and enhances opioid consumption. Patients that are inconvenient to be treated by stepwise approach are treated with minimally invasive interventions for analgesia.

Success in pain treatment is possible when the patients are evaluated by multidisciplinary team of medical specialists and with a treatment plan prepared by this team. We, thereby, are in the opinion that none of the cancer patients would live with uncontrolled pain.

In the present study, we did not collect the patients under the roof of primary focus of cancer. We suggested that presence of metastasis in patients with cancer-related pain enhanced analgesic consumption.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Firat University School of Medicine (10.03.2011, 75).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - Z.Y.K., S.A.Ö.; Design - Z.Y.K., F.Y.; Supervision - Z.Y.K., S.A.Ö.; Funding - Z.Y.K., F.Y., Ö.K.; Materials - Z.Y.K., S.A.Ö., F.Y., Ö.K.; Data Collection and/or Processing - Z.Y.K., S.A.Ö., F.Y., Ö.K.; Analysis and/or Interpretation - Z.Y.K.; Literature Review - Z.Y.K., F.Y., Ö.K.; Writer - Z.Y.K.; Critical Review - Z.Y.K., S.A.Ö., F.Y., Ö.K.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

References

1. Keefe FA, Abernety AP, Campbell CL. Psychological approaches to understanding and treating disease related pain. *Annual Rev Psychol* 2005; 56: 2-22. [\[CrossRef\]](#)
2. Herdon CM. Pharmacologic management of cancer pain. *J Neurosci Nurs* 2003; 35: 312-6.
3. Foley KM. Controlling cancer pain. *Hosp Pract* 2000; 35: 101-8. [\[CrossRef\]](#)
4. Türkoğlu M. Cancer-Related Pain. Yeğül İ. (Editör). Pain and Treatment 1st ed. İzmir: Yapım Matbaacılık, 1993; 123-44.
5. Keller S, Bann CM, Dodd SL, Shein J, Mendoza TR, Cleeland CS. Validity of the brief pain inventory for use in documenting the outcomes of patients with noncancer pain. *Clin J Pain* 2004; 20: 309-18. [\[CrossRef\]](#)
6. Breivik H. Opioids in cancer and chronic non-cancer pain therapy-indications and controversies. *Acta Anaesthesiol Scand* 2001; 45: 1059-66. [\[CrossRef\]](#)
7. Bostrom B, Sandh M, Lundberg D, Fridlund B. Cancer patients experiences of care related to pain management before and after palliative care referral. *Eur J Cancer Care* 2004; 13: 238-45. [\[CrossRef\]](#)
8. Lucas LK, Lipman AG. Recent advances in pharmacotherapy for cancer pain management. *Cancer Pract* 2002; 10: 14-20. [\[CrossRef\]](#)
9. Aşık İ. Treatment of Cancer-Related Pain. Tüzüner F, Alkış N, Aşık İ, Yılmaz AA. (Eds). Anaesthesia, Intensive Care, Pain 1st Ed. İstanbul: Nobel Tıp Kitabevi, 2010; 1613-35.
10. Anonymous. Cancer Statistics. Accessed: <http://www.turkkan-sar.org.tr/>. Accessed date: 01.01.2013.
11. Önal SA. Cancer-Related Pain. Erdine S. (Ed). Pain 3rd Ed. İstanbul: Nobel Tıp Kitabevi, 2007; 551-62.
12. Stjernsward J, Colleau SM, Ventafridda V. The World Health Organization Cancer Pain and Palliative Care Program. Past, present, and future. *J Pain Symptom Manage* 1996; 12: 65-72. [\[CrossRef\]](#)
13. Ventafridda V, Tamburini M, Caraceni A, De Conno F, Naldi F. A validation study of WHO method for cancer pain relief. *Cancer* 1987; 59: 850-6. [\[CrossRef\]](#)
14. Karslı B, Yeğin A. Evaluation of Pain Management in Cancer Therapy. *Journal of the Turkish anaesthesiology and reanimation society* 2005; 33: 253-8.
15. Orhan ME, Bilgin F, Ergin A, Dere K, Güzeldeir ME. Pain Treatment Practice According to the WHO Analgesic Ladder in Cancer Patients: Eight Years Experience of a Single Center. *Ağrı* 2008; 20: 38-44.
16. Afşar F, Pınar R. The Evaluation of Pain And Methods Of Coping With Pain In Cancer Patients. *Journal of Anatolia nursing and health sciences* 2003; 6: 19-28.
17. Zech DF, Grond S, Lynch J, Hertel D, Lehmann KA. Validation of World Health Organization Guidelines for Cancer pain relief: a 10- year prospective study. *Pain* 1995; 63: 65-76. [\[CrossRef\]](#)
18. Zimmermann M. Cancer pain: Pathogenesis therapy, and assessment. *Recent Results Cancer Res* 1991; 121: 8-23. [\[CrossRef\]](#)
19. Practice Guidelines for Cancer Pain Management. A Report by the American Society of Anaesthesiologists Task Force on Pain Management, Cancer Pain Section 1996; 84: 1243-57.
20. Lamer TJ. Treatment of cancer-related pain. When orally administered medications fail. *Mayo Clin Proc* 1994; 69: 473-80. [\[CrossRef\]](#)
21. Güzeldeir ME. Pain and its treatment. 1st Ed. Ankara: GATA Basımevi, 2000; 61-80.
22. Göldeğuş F. Sympathetic Nerve Block. Tüzüner F, Alkış N, Aşık İ, Yılmaz A.A. (Eds). Anaesthesia, Intensive Care, Pain 1st Ed. İstanbul: Nobel Tıp Kitabevi, 2010; 1809-17.