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Research Article

The Effect of Dezocine Combined with Oxycodone in the Treatment of Advanced Lung Cancer with Bone Metastasis and Severe Cancer Pain on the NRS Score of Patients

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ABSTRACT

Background: Lung cancer is a common clinical malignant tumor of the respiratory system. When the disease progresses to the late stage, distant metastasis often occurs, and the metastatic lesions are mostly multiple metastases. Bone is a common distant metastasis site of lung cancer, which can cause complications such as hypercalcemia, osteoporosis, pathological fracture, nerve compression, and severe pain and limited activity. It is one of the important reasons for the decline of quality of life in patients with lung cancer. At present, there is no specific treatment for pain caused by bone metastasis of lung cancer. Drug analgesia is generally used, but there are still some patients with pain symptoms cannot be significantly improved.

Objective: The effect of dezocine combined with oxycodone on the pain score (NRS) of patients with severe cancer pain caused by bone metastasis of advanced lung cancer was analyzed.

Methods: 100 patients were randomly divided into control group (50 cases) and observation group (50 cases). The control group was given intramuscular injection of dezocine for analgesia, and the observation group was given oral oxycodone hydrochloride controlled release tablets on the basis of intramuscular injection of dezocine for analgesia. The changes of NRS score and EORTCQLQ-C30 score were compared. The levels of β-EP and 5-HT were detected.

Results: The pain relief rate and analgesic effective rate of the observation group were better than those of the control group, with statistical significance ($p<0.05$). The NRS score was similar before treatment ($p>0.05$). After 1D, 3D and 7D of treatment, the NRS score of the two groups decreased significantly ($p<0.05$), and the NRS score of the observation group was lower than that of the control group after 1D, 3D and 7D of treatment ($p<0.05$). The number of outbreaks of pain in the observation group was less than that in the control group, the first stable time of pain control was shorter than that in the control group, and the 24 h sleep increase time was longer than that in the control group, with statistical significance ($p<0.05$). After treatment, β -EndocaPeptide (β-EP) in the two groups was significantly increased ($p<0.05$), and 5-hydroxytryptamine (5-HT) was significantly decreased ($p<0.05$). After treatment, β-EP in the observation group was higher than that in the control group, and 5-HT was lower than that in the control group ($p<0.05$). After treatment, the scores of overall health status, function and nausea and vomiting in symptomatic areas of the two groups were significantly higher than those before treatment. The scores of pain, insomnia and loss of appetite in symptomatic areas were significantly lower than those before treatment. Other scores were similar to those before treatment ($p>0.05$). The scores of overall health status function and nausea and vomiting in symptomatic areas of the observation group after treatment were higher than those of the control group. The scores of pain, insomnia and loss of appetite in symptomatic areas were lower than those of the control group. Other scores were similar to those of the control group ($p>0.05$). The adverse reactions of the two groups were similar ($p>0.05$).

Conclusion: Dezocine combined with oxycodone in the treatment of severe cancer pain caused by bone metastasis of advanced lung cancer can effectively relieve pain, regulate the expression of pain factors and improve the quality of life, but the adverse reactions should be observed.

Keywords: Dezocine; Oxycodone; Advanced lung cancer; Adverse reactions

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INTRODUCTION

Lung cancer takes bronchial mucosa as the primary site, and then transfers and spreads through bronchus, lymph and blood. Bone is the most common site of lung cancer metastasis. Bone metastasis is one of the common complications in patients with advanced lung cancer, which can cause osteolytic destruction, cancer pain and seriously affect the quality of life of patients [1]. The World Health Organization (WHO) proposed the three-step analgesic treatment principle. Mild pain was given non-steroidal anti-inflammatory drugs, moderate pain was given weak opioid drugs, and severe pain was given strong opioid drugs [2]. Dezocine is a potent opioid receptor agonist-antagonist, which is commonly used in clinical treatment of severe cancer pain. However, studies have found that some patients still have paroxysmal pain symptoms after using dezocine alone, and the analgesic effect is not stable [3].

Oxycodone is a pure opioid receptor agonist, which can act on opioid β-receptor and κ receptor. Oxycodone has analgesic effects on various pains, and has more prominent effects on visceral pain and neuropathic pain. Studies have shown that the analgesic effect of oxycodone is more than twice that of morphine [4]. The difference between dezocine and oxycodone in the treatment of severe cancer pain in advanced lung cancer with bone metastasis is worthy of further discussion. In this study, the pain score (NRS) was used as a tool to analyze the effect of dezocine combined with oxycodone on the pain degree of patients with severe cancer pain caused by bone metastasis of advanced lung cancer.

MATERIALS AND METHODOLOGY

General information

A total of 100 patients from January 2020 to May 2021 were randomly divided into control group (50 cases) and observation group (50 cases). The age was 35-75 years old, with an average of (62.04 ± 9.82) year old. BMI (22.52 ± 2.06) kg /m^2 .The observation group had 26 males and 24 females aged 33-75 years old, with an average of (60.98 ± 10.05) years old. BMI is (22.45 ± 2.24) kg/m^2 . Two groups of patients during the trial, no shedding, lost to follow-up cases, the final completion of 100 cases.

Diagnostic standards

Western medicine: Standard with clear local growth performance of primary lung cancer. There has been a distant transfer. Pathological examination and immunohistochemistry confirmed non-small cell lung cancer and confirmed by imaging [5].

Inclusion of the standards: According to the standard of advanced lung cancer, UICC belongs to stage IV, and ≥ 1 target lesion can be measured.

Elimination standards: Heart, liver, renal insufficiency or disorder. Other respiratory diseases like allergic constitution.

Observation index: The changes of NRS score and EORTCQLQ-C30 score were compared. The levels of β-EP and 5-HT were detected.

Mechanism exploration: Before treatment and 14 days after treatment, 2 ml of fasting peripheral venous blood samples were collected and placed in EDTA anticoagulant tube.

Efficacy criteria and scoring criteria: Reference NRS score decline rate assessment: Decline ≥ 75% for significant remission. 50% ≤ decrease<75% is moderate remission. 25% ≤ decrease <50% is an mild remission. Failure to meet the above criteria is non-relieving. Significant, moderate and mild relief for pain relief, significant and moderate relief for pain relief.

NRS score: 0-3 points for mild pain, 4-7 points for moderate pain, 8-10 points for severe pain [6].

EORTCQLQ-C30 score: It includes the overall health status field, functional field (5 items), and symptomatic field (9 items). The single score is based on the percentage system. The overall health status field and functional field are proportional to the quality of life, and the symptomatic field is inversely proportional to the quality of life [7].

Statistical methods: SPSS was used to process the data. The measurement index was described as ($\chi \pm s$). Independent sample t test was used for comparison between groups. Paired t test was used for comparison within groups. χ^2 test was used for comparison of rates and $p<0.05$ was statistically significant.

RESULTS

Comparison of pain relief efficacy in the two groups

The significant and moderate remission was 15 and 17,12 mild, a pain relief rate of 88.00% and pain efficiency of 64.00%, both superior to control and statistically significant ($p<0.05$) as shown in Table 1.

Comparison of the NRS scores of the two groups

The pre-treatment NRS score was similar ($p>0.05$), which decreased significantly compared with pre-treatment ($p<0.05$) and lower after 1D, 3D, 7D than in the control group ($p<0.05$) as shown in Table 2.

Comparison of the number of 24-hour bursts of pain, the time of 24-hour sleep increase and the first stable time of pain control between the two groups

Observation group 24 h bursts were less than the control, first pain control stabilization less than the control, and 24 h sleep increased longer than the control ($p<0.05$) as shown in Table 3.

Comparison of the two groups of β-EP, 5-HT

Pre-treatment β-EP, 5-HT was similar ($p>0.05$), β-EP increased significantly before treatment ($p<0.05$), 5-HT lower before treatment ($p<0.05$), and higher after treatment in the observation group and 5-HT lower than the control group ($p<0.05$) as shown in Table 4.

Comparison of the EORTCQLQ-C30 scores of the two groups

The EORTCQLQ-C30 scores before treatment were similar ($p>0.05$). After treatment, the scores of overall health status, function and nausea and vomiting in symptomatic areas of the two groups were significantly higher than those before treatment. The scores of pain, insomnia and loss of appetite in symptomatic areas were significantly lower than those before treatment. The scores of fatigue, shortness of breath, constipation, diarrhea and economic difficulties in symptomatic areas were similar to those before treatment ($p>0.05$). The scores of overall health status function and nausea and vomiting in symptomatic areas of the observation group were higher than those of the control group. The scores of pain, insomnia and loss of appetite in symptomatic areas were lower than those of the control group. The scores of fatigue, shortness of breath, constipation, diarrhoea and economic difficulties in symptomatic areas were similar to those of the control group ($p>0.05$) as shown in Table 5.

Table 1: Comparison of analgesic effects between the two groups (%).

Group	Number of cases	Significant relief	Moderate remission	Mild relief	No remission	Pain relief rate	Effective for pain relief
Control group	50	6	16	14	14	36 (72.00)	22 (44.00)
Observation group	50	15	17	12	6	44 (88.00)#	32 (64.00)#

Note: Compared with the controls, #p<0.05

Table 2: Comparison of NRS scores between the two groups ($\bar{\chi}$ ± s Minute).

Group	Number of cases	NRS			
		Before treatment	Treatment 1D	Treatment 3D	Treatment 7D
Control group	50	8.89 ± 0.46	7.12 ± 1.01*	6.03 ± 0.67*	4.08 ± 0.71*
Observation group	50	8.95 ± 0.42	6.33 ± 0.90*#	5.12 ± 0.59*#	2.26 ± 0.54*#

Note: *p<00.05; compared with the control group, #p<0.05

Table 3: Comparison of NRS scores between the two groups ($\bar{\chi}$ ± s Minute).

Group	Number of cases	Number of burst pains in 24 h (times)	24 h sleep increase time (h)	Time to first stabilization of pain control (h)
Control group	50	2.05 ± 0.46	1.02 ± 0.33	76.96 ± 18.68
Observation group	50	1.22 ± 0.35#	1.68 ± 0.37#	65.14 ± 12.75#

Note: Compared with the controls, #p<0.05

Table 4: Comparison of the two groups of β-EP and 5-HT ($\bar{\chi}$ ± s ng/L).

Group	Number of cases	Time	β-EP	5-HT
Control group	50	Before treatment	95.36 ± 18.02	0.96 ± 0.32
		After treatment	137.22 ± 26.35*	0.67 ± 0.27*
Observation group	50	Before treatment	94.05 ± 19.63	0.93 ± 0.36
		After treatment	162.85 ± 29.41*#	0.56 ± 0.24*#

Note: *p<00.05; compared with the control group, #p<0.05.

Table 5: Comparison of EORTCQLQ-C30 scores between the two groups($\bar{\chi}$ ± s Minute).

Score	Control group (n=50)		Observation group (n=50)		
After treatment	Before treatment	After treatment	Before treatment		After treatment
General health field	35.52 ± 5.69	41.69 ± 5.33*	34.97 ± 5.82	43.96 ± 4.71*#	After treatment
Functional area	Physical function	42.36 ± 5.02	46.66 ± 4.78*	42.16 ± 5.81	50.33 ± 4.69*#
	Role function	51.44 ± 5.23	56.02 ± 3.89*	50.89 ± 5.83	59.91 ± 4.17*#
	Emotional function	46.36 ± 6.05	52.69 ± 4.72*	45.98 ± 5.74	59.36 ± 5.57*#
	Cognitive function	58.63 ± 5.63	65.32 ± 4.52*	58.96 ± 5.99	70.14 ± 4.63*
	Social function	52.36 ± 4.69	58.96 ± 4.45*	52.17 ± 5.06	63.74 ± 3.99*#
Symptomatic areas	Tired	31.52 ± 3.63	30.58 ± 3.85	30.98 ± 4.05	29.92 ± 3.69
	Pain	28.65 ± 3.14	25.45 ± 3.01*	28.55 ± 3.36	22.96 ± 2.57*#
	Feel sick and vomit	28.25 ± 4.02	30.69 ± 3.85*	28.17 ± 3.96	33.15 ± 3.16*#
	Shortness of breath	24.69 ± 3.36	24.45 ± 4.32	24.71 ± 4.05	25.01 ± 4.17
	Insomnia	33.25 ± 4.15	27.25 ± 3.21*	33.34 ± 4.74	24.66 ± 2.73*#
	Loss of appetite	41.22 ± 4.03	35.23 ± 3.66*	41.09 ± 4.28	32.88 ± 3.79*#
	Constipation	28.52 ± 3.96	27.96 ± 4.12	28.46 ± 3.96	28.02 ± 3.24
	Diarrhea	27.96 ± 3.54	27.89 ± 3.58	28.02 ± 3.88	28.23 ± 3.24
	Economic difficulties	36.63 ± 5.88	36.99 ± 5.41	36.89 ± 4.58	26.56 ± 5.27

Note: *p<00.05; compared with the control group, #p<0.05

Safety analysis

The observation group had nausea and vomiting in 6 cases, dizziness in 3 cases, drowsiness in 1 case, a total of 10 cases, the incidence was 20.00%. The control group occurred nausea and vomiting in 3 cases, dizziness in 1 case, 1 case of drowsiness, a total of 5 cases, the incidence of 10.00%. The adverse reactions of the two groups were similar (p>0.05).

DISCUSSION

The mechanism of cancer pain is complicated, which is related to the pain caused by tumor itself and the pain caused by tumour treatment. Patients with bone metastasis of lung cancer need to suffer from severe cancer pain. Pain can cause negative emotions, sleep disorders and decreased treatment compliance. The above results can increase the sensitivity of the body to pain, further aggravate cancer pain, so as to form a vicious circle, which not only

affects the compliance of anti-cancer treatment of patients with bone metastasis of lung cancer, but also leads to a decline in quality of life [8]. Dezocine is a commonly used drug in the clinical treatment of cancer pain. It can completely excite the κ receptor, weaken the influence on the μ receptor, and do not lead to addiction. It has the advantages of rapid onset and less adverse reactions. Intramuscular injection of dezocine can avoid stimulating the gastrointestinal tract, especially for patients who cannot eat [9].

In this study, dezocine combined with oxycodone was applied to the treatment of severe cancer pain in bone metastasis of advanced lung cancer [10,11]. The NRS score was used to evaluate the degree of pain. It was found that dezocine combined with oxycodone had better short-term analgesic effect in the treatment of severe cancer pain in bone metastasis of advanced lung cancer, which could better reduce the number of pain outbreaks in 24 h, shorten the first stable time of pain control, and prolong the time of sleep increase in 24 h.

This is because oxycodone hydrochloride sustained-release tablets have two release modes:

- Immediate release and
- Controlled release

Among them, 38% of the components rapidly produce analgesic effect after oral administration for 1 h, and 62% of the components slowly release within 12 h, playing a continuous analgesic effect, so that patients ' cancer pain can be better controlled and help patients sleep. After better rest, the patient's emotional state improved and his tolerance to pain increased [12].

NRS score is a subjective pain assessment tool, and its final results are affected by many factors such as patient tolerance and understanding [13]. The laboratory pain related factors have certain objectivity in indicating the degree of pain. β-EP is a kind of morphine hormone secreted by the pituitary gland, which can produce pleasure and analgesic effect [14,15]. In this study, the levels of β-EP and 5-HT in the two groups before and after treatment were detected. It was found that dezocine combined with oxycodone in the treatment of severe cancer pain in advanced lung cancer with bone metastasis can increase the level of endogenous analgesic factor β−EP, reduce the level of pain-causing factor β-EP, and regulate the expression of pain factors.

In this study, EORTCQLQ-C30 was used to evaluate the quality of life of patients in the two groups. The study also found that the incidence of nausea and vomiting, dizziness, drowsiness and other adverse reactions in patients treated with dezocine combined with oxycodone was higher than that in patients treated with dezocine alone. However, the statistical analysis results of the two groups showed similar adverse reactions. This may be related to the bias caused by the small sample size of this study. In the future, large sample studies should be accumulated to explore whether dezocine combined with oxycodone regimen will increase the risk of adverse reactions.

CONCLUSION

In summary, dezocine combined with oxycodone in the treatment of severe cancer pain caused by bone metastasis of advanced lung cancer can effectively relieve pain, regulate the expression of pain factors and improve the quality of life, but the adverse reactions should be observed. In clinical application, attention should be paid to balance the advantages and disadvantages between analgesia and adverse reactions, and oxycodone should be used as appropriate.

CONFLICT OF INTEREST

The author declares there is no conflict of interest.

REFERENCES

1. Washington KT, Oliver DP, Smith JB, Kruse RL, Meghani SH, Demiris G. A comparison of rural and urban hospice family caregivers cancer pain knowledge and experience. J Pain Symptom Manag.2019; 58(4): 685-689.
2. Loeffen EA, Kremer LC, Van de Wetering MD, Mulder RL, Fontl Gonzalez A, Dupuis LL, et al. Reducing pain in children with cancer: Methodology for the development of a clinical practice guideline. Pediatr Blood Cancer. 2019; 66(6): e27698.
3. Brant JM. Assessment and management of cancer pain in older adults: strategies for success. Asia Pac J Oncol Nurs. 2018; 5(3): 248.
4. Ngamkham S, Holden JE, Smith EL. A systematic review: Mindfulness intervention for cancer-related pain. Asia Pac J Oncol Nurs. 2019; 6(2): 161.
5. Csco CS. Chinese Society of Clinical Oncology (CSCO) diagnosis and treatment guidelines for colorectal cancer 2018 (English version). Chin J Cancer Res. 2019; 31(1): 117-134.
6. Zhou X, Qiu GQ, Bao WA, Zhang DH. The prognostic role of nutrition risk score (NRS) in patients with metastatic or recurrent esophageal squamous cell carcinoma (ESCC). Oncotarget. 2017; 8(44): 77465.
7. National Health Commission of the People's Republic of China. Chinese guidelines for diagnosis and treatment of cervical cancer 2018 (English version). Chin J Cancer Res. 2019; 31(2): 295.
8. Kim KS, Loring S, Kwekkeboom K. Use of art-making intervention for pain and quality of life among cancer patients: A systematic review. J Holist Nurs. 2018; 36(4): 341-353.
9. Jenkins BN, Roemer RJ, Martinez A, Torres TK, Fortier MA. Cold pressor pain response in children with cancer. J Pediatr Hematol Oncol. 2018; 40(5): 368-373.
10. Sipilä R, Hintsa T, Lipsanen J, Tasmuth T, Estlander AM, Kalso E. The relationship between anger regulation, mood, pain, and pain–related disability in women treated for breast cancer. Psychooncology. 2019; 28(10): 2002-2008.
11. Ishida K, Ohnuki K, Usami S, Komatsu H, Sasaki A. A survey on the current status of clinical resources for diagnosis and treatment of breast cancer in rural hospitals of the Tohoku region in Japan. Breast Cancer. 2021; 28(1): 161-167.
12. Ulas S, Eyigor S, Caramat I. Quality of life and neuropathic pain in hospitalized cancer patients: A comparative analysis of patients in palliative care wards versus those in general wards. Indian J Palliat Care. 2018; 24(3): 322-325.
13. Nawi RI, Chui PL, Ishak WZ, Chan CM. Oral cryotherapy: Prevention of oral mucositis and pain among patients with colorectal cancer undergoing chemotherapy. Clin J Oncol Nurs. 2018; 22(5): 555-560.
14. Jin PC, Gou B, Qian W. Urinary markers in treatment monitoring of lung cancer patients with bone metastasis. Int J Biol Markers. 2019; 34(3): 243-250.
15. Soran A, Dogan L, Isik A, Ozbas S, Trabulus DC, Demirci U, et al. The effect of primary surgery in patients with *de novo* stage breast cancer with bone metastasis only (protocol bomet mf): A multi-center, prospective registry study. Ann Surg Oncol. 2021; 1(10): 1-10.