

# Comparison of clinical effect in treatment of bone tumor between zoledronic acid needle and ibandronate needle

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**Abstract:** To observe and analyze the clinical effect of zoledronic acid needle and ibandronate needle in treatment of bone tumor. 100 patients who have been treated in our hospital for bone tumor were selected as research objects. They were randomly divided into research group and control group, each containing 50 patients. The research group was applied with ibandronate needle therapy, while the control group was given with zoledronic acid needle therapy. After treatment, the clinical effects of the two groups were observed and analyzed. Through comparing the pain relief rate after treatment between the two groups, it can be known that the pain relief rate of research group was relatively higher,  $P < 0.05$ ; the rate of adverse effect in research group was relatively lower,  $P < 0.05$ ; the quality of life score (QLS) of research group was significantly superior to that of control group,  $P < 0.05$ . the ibandronate needle therapy is a more reliable and superior method in treatment of bone tumor compared with zoledronic acid needle therapy, which should be promoted in clinical treatment.

**Keywords:** Zoledronic acid needle, Ibandronate needle, Bone tumor, clinical effect.

## INTRODUCTION

The change of modern life style, people's dietary structure and living habits are also changed greatly, which leads to health problems in certain degree. In recent years, the population of bone tumor patients has been continuously increased. Bone tumor, of which the most major clinical symptom is bone pain, will cause severe threats to people's normal life and even life (Pan *et al.*, 2015, Esim *et al.*, 2018, Zheng *et al.*, 2017).

Bone tumors refer to the malignant tumors occurred at bone (fig. 1), including osteosarcoma, chondrosarcoma, fibrosarcoma, multiple myeloma, chordoma, retothelial sarcoma, etc. The main symptoms of bone tumor include anaemia, fatigue, malnutrition, cachexia. For patient with bone tumor, local pain and pressing pain are two commonest symptoms, which occur prior to or simultaneously with lump, beginning with slight pain, then to intermittent dull pain and finally to persistent severe pain (Li and Qin 2015, He *et al.*, 2016). Moreover, symptoms also include touchable bone dilatation and soft tissue mass at superficial area, kermesinus skin, increased skin temperature, forming of larger mass within short period of time, dysfunction, skeleton deformity (fig. 2) and pathological fracture (fig. 3). The main object is to reduce bone pain effectively and increase therapeutic effect. This study explores the clinical effect in treatment of bone

tumor between zoledronic acid needle and ibandronate needle.

## MATERIALS AND METHODS

In this study, 100 patients who have been confirmed with bone tumor in our hospital from January 2015 to December 2017 were selected as research objects. The selected patients and relatives signed the informed consent before treatment. This study has obtained the approval from hospital ethics committee. The selected patients were randomly divided into research group and control group, each containing 50 patients. The research group contains 26 males and 24 females, with age ranging between 12-80 (averaging at  $26.9 \pm 3.3$ ) and the onset sites including femur (16 patients), tibia (14 patients), humerus (10 patients), radius (5 patients), other (5 patients). In contrast, the control group contained 28 males and 22 females, with age ranging between 14-78 (averaging at  $27.5 \pm 3.0$ ) and the onset sites including femur (18 patients), tibia (16 patients), humerus (11 patients), radius (3 patients), other (2 patients). Through comparing the data of two groups, the difference was of statistical significance,  $P > 0.05$  (Wang *et al.*, 2018).

(1) Treatment method for control group. The control group was given with zoledronic acid needle therapy (i.e. Zoledronic Acid Injection in 5ml: 4mg). The injection consisting of 100ml of zoledronic acid needle and 0.9%

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sodium chloride was given once a month for consecutive half year.



Fig. 1: Bone tumor



Fig. 2: Skeleton deformity

(2) The treatment method for research group. The research group was given with ibandronate needle therapy (1ml: 1mg). The injection consisting of 500ml of ibandronate needle and 0.9% sodium chloride was given once a month for consecutive half year (Gao *et al.*, 2017).

#### Observation indexes

After treatment for half year, the total therapeutic effects of two groups were observed and analyzed, including pain relief rate, QLS, rate of adverse effect. In terms of pain relief rate, the criteria of complete relief include complete removal of pain and unlimited motion (Sezgin 2017); the criteria of partial relief include significant relief of pain and acceptable pain; the criteria of slight relief include slight relief after treatment and tolerable pain after taking drug; the criteria of no relief include no relief or even aggregation of pain after treatment. According to Kamofsky scale, the QLS of patients was measure,

including significant improvement (20 points), improvement (10 points), degradation (under 10 points).



Fig. 3: Pathological fracture

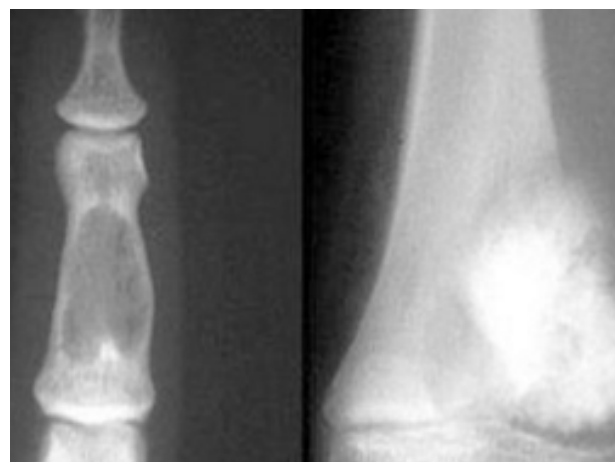


Fig. 4: Primary bone tumor

#### STATISTICAL ANALYSIS

The statistical analysis was carried out using SPSS21.0. The measurement data was expressed in the form of mean value  $\pm$  average value ( $\pm s$ ) and the intergroup difference was tested by *t*. The enumeration data was expressed in natural number (*n*) and percentage (%) and the intergroup difference was tested by  $\chi^2$ . When  $P < 0.05$ , the intergroup difference was of statistical significance.

#### RESULTS

##### Comparison of pain relief rate between two groups

As shown in table 1, after a complete course of treatment for both groups, the pain relief rate of research group accepting ibandronate needle therapy is significantly higher than that of control group accepting zoledronic acid needle therapy, and the intergroup difference is of statistical significance,  $P < 0.05$ .

**Table 1:** Comparison of pain relief rate between two groups

Group	Complete relief	Partial relief	Slight relief	No relief	Pain relief rate
Research group(n=50)	25	14	7	4	46(92.00)
Control group(n=50)	20	10	8	12	38(76.00)
X <sup>2</sup>					14.57
P					<0.05

**Table 2:** Comparison of improvement of QLS between two groups

Group	Significant improvement	Improvement	Unchanged	Degradation	Improvement rate of QLS
Research group (n=50)	20	15	9	6	44(88.00)
Control group(n=50)	15	16	7	12	38(76.00 )
X <sup>2</sup>					9.62
P					<0.05

**Table 3:** Comparison of rate of adverse effect between two groups [n(%)]

Group	Number	Fever	Nausea and vomiting	Weakness	Grade I leukocyte decrease	Renal toxicity	Rate of adverse effect
Research group	50	2	1	2	1	4	10(20.00)
Control group	50	3	3	4	2	8	20(40.00)
X <sup>2</sup>							8.52
P							<0.05

**Comparison of improvement of QLS between two groups**

As shown in table 2, there is a significant difference in the improvement of QLS between two groups, and the intergroup difference is of statistical significance,  $P < 0.05$ .

**Comparison of rate of adverse effect between two groups**

As shown in table 3, the rate of adverse effect of research group is significantly lower than that of control group, and the intergroup difference is of statistical significance,  $P < 0.05$ .

**DISCUSSION**

Bone tumor can be categorized into primary bone tumor and metastatic bone tumor. This disease has significant symptoms and higher disability and mortality. The severe pain derived from this disease will make great impact to the normal life of patients. The treatment course of this disease is relative longer and the cost will be a great economic burden for the family (Philippe 2014). According to the epidemiological survey, the incident rate of bone tumor in China is on a rising trend, and the incident rate in rural China is higher than that in urban China. The bone tumor accounts for about 0.67% of all malignant tumor (Nikhil 2015, Akin *et al.*, 2017). Therefore, an effective therapy to reduce pain and increase quality of life is urgently needed, which has become a focused top in medical community (Kumar and Dhobi 2017).

For primary bone tumor (fig. 4), a conservative surgical excision is normally adopted to achieve ideal results.

According to the survey results of relevant data, 80% of osteosarcoma patients accepting conservative surgical treatment enjoy increased survival rate. For those who are not suitable for conservative surgical treatment, amputation surgery is alternatively selected. However, surgical treatment will inevitably cause large wound and easily lead to spread and transfer of malignant tumor tissues, which should be highly concerned.

Zoledronic acid needle and ibandronate needle are two common drugs for bone tumor, with wide range of application. The action mechanism of zoledronic acid needle is to inhibit the bone resorption. Zoledronic acid needle may cause slight adverse effect, which can be recovered after targeted treatment (Li 2015). In addition, zoledronic acid needle is forbidden for those with renal dysfunction or aspirin allergy. In contrast, ibandronate needle is a typical bisphosphonate which has been used in wide range of clinical treatments. This drug can inhibit bone resorption and help patients reduce pain and improve quality of life (Pan *et al.*, 2014, Qu and Guo 2015).

The results of this study show that after a complete course of treatment, the pain relief rate of research group accepting ibandronate needle therapy was higher than that of control group accepting zoledronic acid needle therapy, and the intergroup difference was of statistical significance,  $P < 0.05$ . The improvement of QLS of research group was higher than that of control group, and the intergroup difference was of statistical significance,  $P < 0.05$ . In addition, the rate of adverse effect of research

group was lower than that of control group, and the intergroup difference was of statistical significance,  $P < 0.05$ . Therefore, it can be concluded that ibandronate needle therapy is a better and more effective therapy.

## CONCLUSION

In conclusion, sodium ibandronate is a typical diphosphonic acid drug, which is generally effective in a large number of clinical applications. It can block and inhibit bone absorption and help patients improve pain sensation. Compared to zoledronic acid needle therapy, ibandronate needle therapy can give patients better comfort, thus improving the quality of life, and at the same time can significantly reduce the incidence of adverse reactions and reduce the rate of complications. Ibandronate needle therapy can obtain a more ideal treatment effect, higher safety and reliability, earn patient's general satisfaction. Therefore, it should be popularized and applied in treatment for more patients.

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