Clinical therapeutic effect and safety of celecoxib in treating knee osteoarthritis

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Abstract: The clinical therapeutic effect and safety of celecoxib in treating knee osteoarthritis were observed. 180 patients who have been confirmed with knee osteoarthritis in our hospital were selected as research objects. They were randomly divided into research group and control group, each containing 90 patients. The control group was given with diclofenac sodium therapy, while the research group was subjected to celecoxib therapy. The total therapeutic response rates between the two groups were observed and compared. The total therapeutic response rate of research groups was relatively higher, $P<0.05$. There was no significant difference in pain score, erythrocyte sedimentation rate (ESR), quality of life score (QLS) between two groups before treatment, $P>0.05$. However, these indexes of research group were superior then the control group after treatment, $P<0.05$. In addition, the rate of adverse reaction of research group was also lower than that of control group, $P<0.05$. Using celecoxib to treat knee osteoarthritis can significantly improve the total therapeutic rate and reduce the rate of adverse effect.

Keywords: Celecoxib, knee osteoarthritis, clinical therapeutic effect, safety.

INTRODUCTION

The number of elderly patients with knee osteoarthritis has become increasingly large with the intensifying of aging. Currently, the pathogenesis of such disease remains unclear, which brings big difficulty in clinical treatment (Ai, 2017; Hanafiah *et al*., 2017). Common therapies for such disease can be divided into drug therapy, physical therapy and surgical therapy, these therapies can improve the movement function of knee in certain degree.

For the better treatment of knee osteoarthritis, it is necessary to seek an optimal treatment approach. Knee osteoarthritis (fig. 1) is a chronic osteoarthrosis caused by knee cartilage degeneration or hyperostosis and has two onset forms: single onset and multiple onsets. There are many factors causing such disease, including chronic strain, inherited factor, bone density, obesity, injury or external force (Cao, 2016; Enikő, *et al*., 2014; Shaikh *et al*., 2017). Surgical treatments for such disease include arthroscopically assisted, exploratory and debridement and total knee replacement (TKR, fig. 2). However, due to relatively large wound of surgical treatment, some patients may prefer drug therapy, for instance celecoxib therapy is one of them. This study observes and investigates the clinical therapeutic effect and safety of celecoxib in treating knee osteoarthritis.

MATERIALS AND METHODS

The objects of this study are 180 patients who have been confirmed with knee osteoarthritis in our hospital from June 2015 to December 2017. This paper has a rigorous structure, and the conclusion has been approved by relevant ethics and relevant departments. According to the contents prescribed in "Diagnostic Guidelines for Osteoarthritis" (Peng, 2016; Aldaihani and Alenezi, 2017), the western medicinal symptoms of knee osteoarthritis include frequent occurrence of knee joint pain within 1 month, narrowing of knee joint space, sclerosis or cystic lesions of lower part of the cartilage, existing of transparent and viscous joint fluid, white blood cell count less than 2000/mL. According to "Diagnostic criteria of TCM disease syndrome" (Ren, Wang, 2016; Atta *et al*., 2017), the TCM symptoms of such disease include knee joint pain, difficulty in flexion and extension, intensified pain upon weather change and joint deformity. The selected 180 objects were randomly divided into research group and control group, each containing 90. The patients and relatives have signed the informed consent form. In research group, there were 45 males and 45 females, with age ranging from 48-80 years old (averaging at 60.4±3.2); in control group, there were 48 males and 42 females, with age ranging from 50-82 years old, averaging at 59.5±3.6. Through comparing the data of the two groups, there was no significantly difference between two groups before treatment, $P>0.05$, without statistical significance (Jones, *et al*., 2014; Farid *et al*., 2018).

The research group was given with celecoxib therapy while the control group was applied with diclofenac sodium therapy. The patients of both groups were subjected to intra-articular injection of sodium hyaluronate (2mL), one injection a weak, for 6 consecutive weeks. On this basis, the patients in control

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group were guided to take oral administration of diclofenac sodium after meal, 50mg for each administration, three times a day. However, the patients in research group was orally administrated with celecoxib after meal, 50mg for each administration, and two times a day. The treatment duration for two groups were both 6 weeks. Total therapeutic response rates between two groups have evaluated after 6 weeks (Isik, *et al*., 2017; Kishore *et al*., 2017).

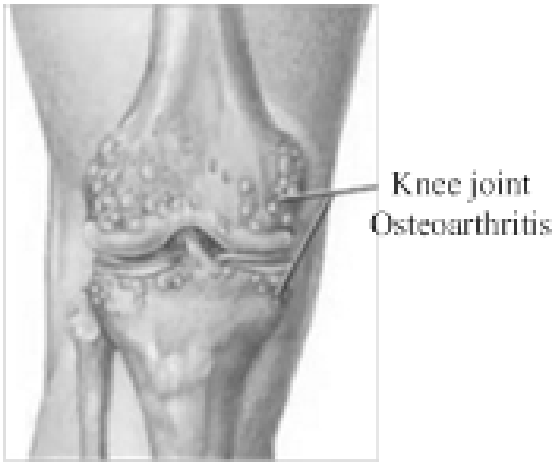

Fig. 1: Knee osteoarthritis

Fig. 2: Conditions before and total knee replacement

Observation indexes

The total therapeutic response rate, pain score, ESR, QLS and rate of adverse effect between two groups were compared. In terms of total therapeutic response rate, there are three standards: significant effective, effective and ineffective. The criteria for significant effectiveness include complete removal of clinical symptoms, no pain, significantly improvement compared to the conditions before treatment, well recovery of motor function (Driban, *et al*., 2016; Muhammad *et al*., 2017). The criteria for effectiveness include relief of clinical symptoms to certain extent and less pain after treatment. The criteria for ineffectiveness include no improvement or even aggravation after treatment (He *et al*., 2016; Chuanlei *et al*., 2018).

STATISTICAL ANALYSIS

Statistical analysis was carried out using software SPSS21.0. The measurement data were expressed in the form of mean value ± average value (±s), the inter-group difference was tested by t. The enumeration data were expressed in natural number (n) and percentage (%), the intergroup difference was tested by Chi-square. When $P<0.05$, the difference is of statistical significance (Pati *et al*., 2017; Peng *et al*., 2017; Rizvi and Saleh 2018).

RESULTS

Comparison of total therapeutic response rate between two groups

As shown in table 1, the total therapeutic response rate of research group is 95.56%, which is significantly higher than 75.56% of control group. $P<0.05$, the difference is of statistical significance.

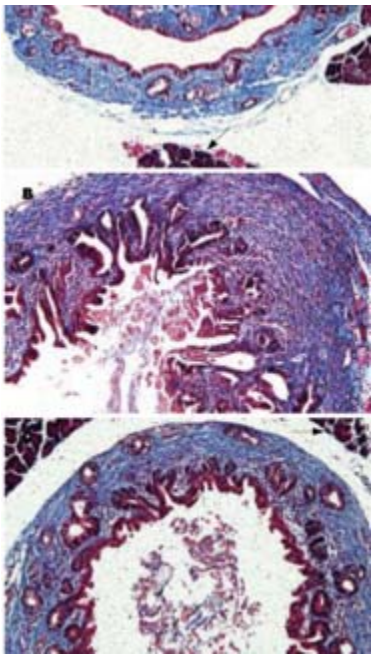

Fig. 3: Function diagram of celecoxib

Comparison of pain score, ESR, QLS between two groups

As shown in table 2, the improvements of pain score, ESR, QLS of research group after treatment were significantly larger than that of control group, $P<0.05$, there is statistical significance.

Comparison of rate of adverse effect

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

DISCUSSION

As one of common diseases in clinics at present, knee osteoarthritis has high incidence rate and possesses main symptoms including joint pain, different degrees of

Table 1: Comparison of total therapeutic response rate between two groups [n(%)]

Group	Number	Significantly effective	Effective	Ineffective	Total therapeutic response rate
Research group	90	50	36	4	86(95.56)
Control group	90	40	28	22	68(75.56)
X^2					14.59
P					<0.05

Table 2: Comparison of pain score, ESR, QLS between two groups ($\bar{x}\pm s$)

Group	Pain score (point)		ESR (mm/h)		QLS (point)	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Research group (n=90)	5.32±1.37	1.52±0.43	77.25±10.27	23.60±11.36	62.03±0.65	93.12±0.78
Control group (n=90)	5.24±1.37	2.44±0.47	77.80±16.30	42.36±13.27	62.68±0.89	82.25±0.50
t	0.12	4.68	0.30	7.59	0.11	12.18
P	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

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

Group	Number	Nausea	Stomach burning	Poor appetite	Rate of adverse effect
Research group	90	1	1	0	2(2.22)
Control group	90	4	5	4	13(14.44)
X^2					8.63
P					<0.05

hydrops articuli and limitation of motion, etc. Drug therapy and surgical therapy are two common forms of treatment for such disease. Elderly patients have lower resistance and poorer metabolic function, therefore they normally suffer longer course of disease and are not easily to acquire healing effect. In addition, surgical approach may cause certain degree of trauma that inhibits the full therapeutic effect, therefore many patients choose drug therapy for conservative treatment.

For treatment of knee osteoarthritis, diclofenac sodium and celecoxib are two major drugs. Diclofenac sodium, belonging to non-steroidal anti-inflammatory drugs, has significant analgesic efficacy via inhibiting COX-2, but may also lead to gastrointestinal side effects by inhibiting COX-1, which is a problem that cannot be ignored (Tang, *et al*., 2015; Zhang, *et al*., 2016; Gao, *et al*., 2017). Therefore, using diclofenac sodium to treat knee osteoarthritis may cause adverse effect that will inhibit the full play of therapeutic efficacy. In contrast, celecoxib is a typical anti-inflammatory drug (fig. 3) and a caffeic acid phenethylester of COX-2, which can exert anti-inflammatory and analgesic effect without affecting physiological process of gastrointestinal tract. Therefore, celecoxib is more safe and reliable drug, which can significantly reduce gastrointestinal reaction and is more suitable for treating knee osteoarthritis.

The results of the present study showed that total therapeutic response rate of research group was higher than that of control group, P<0.05; There was no significant difference in pain score, ESR, QLS between research group and control group before treatment, P>0.05. However, the improvements of these indexes in research group after treatment were superior to that of control group, P<0.05. In addition, the rate of adverse effect in research group was lower, P<0.05. All these results indicate the effectiveness of celecoxib in treatment of knee osteoarthritis.

CONCLUSION

In conclusion, using celecoxib to knee osteoarthritis can significantly improve total therapeutic response rate, improve clinical symptoms and reduce the rate of adverse effect. Therefore, celecoxib therapy is worth of being massively promoted in clinics.

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