

Clinical Efficacy of Lenalidomide Combined with Cyclophosphamide and Dexamethasone in the Treatment of Multiple Myeloma

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Abstract: *Objective:* Multiple myeloma has a great impact on patients; the use of implant denture restorative treatment is ideal, and it is vital to carry out scientific treatment methods. *Methods:* The research subjects were inclusive of 60 patients with multiple myeloma, who were randomly selected from January 2019 to December 2019. The patients were divided into a study group and a control group, with 30 patients in each group. The patients in the control group were treated with conventional treatment, while the patients in the study group were treated with lenalidomide combined with cyclophosphamide and dexamethasone. The effectiveness of treatment, adverse effects, and clinical indices of the two groups were compared. *Results:* Comparing different treatment methods, the differences in the indices between the two groups were statistically significant ($p < 0.05$). *Conclusion:* The use of lenalidomide combined with cyclophosphamide and dexamethasone in the treatment of patients with multiple myeloma increases the effectiveness of treatment and improves patients' clinical indices; thus, it is worthy of promotion.

Keywords: Multiple myeloma; Lenalidomide combined with cyclophosphamide and dexamethasone; Conventional treatment; Clinical efficacy

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1. Introduction

Multiple myeloma, abbreviated as MM, is a malignant plasma cell disease, and its tumor cells originate from plasma cells in the bone marrow, which are a group of B lymphocytes that have developed to their final functional stage. Multiple myeloma is currently classified as a type of B-cell lymphoma, and it is also known as plasma cell myeloma or plasmacytoma. It is characterized by an abnormal proliferation of bone marrow plasma cells with monoclonal immunoglobulin or M protein overproduction and, in rare cases, a gastric differentiated MM without M protein production^[1-4]. Patients with multiple myeloma often have multiple osteolytic lesions, hypercalcemia, anemia, and renal damage. Moreover, they are prone to various bacterial infections and pulmonary infections that are not easily controlled due to the suppression of normal immunoglobulin production. Different treatment approaches for these patients have varying effects on their recovery^[5-9]. For this reason, this study focuses on the value of lenalidomide combined with cyclophosphamide and dexamethasone treatment as well as conventional treatment in patients with multiple myeloma.

2. Materials and methods

2.1. General information

From January 2019 to December 2019, 60 patients with multiple myeloma were recruited as research subjects for this study. In the control group, the male to female ratio, age, and time of admission were 19:11, all around 60, and 3.62 ± 0.96 hours, respectively. In the study group, the male to female ratio, age, and time of admission were 18:12, all around 60, and 3.12 ± 1.06 hours, respectively

Inclusion criteria: (1) patients diagnosed with indications of multiple myeloma [10]; (2) patients who are able to communicate normally; (3) patients whose age is above 18.

Exclusion criteria: (1) patients with other malignancies; (2) patients with cognitive impairment; (3) those with contraindications to medication and poor compliance.

2.2. Methods

2.2.1. Control group

The control group was treated with 0.15 mg/kg/day or 6 mg/m² of Mafran for 5 days, combined with 10-60 mg (2-12 tablets) (5-10 mg or 1-2 tablets each time) of oral prednisone (Tianjin Lisheng Pharmaceutical Co., Ltd., State Drug quantification H12020123) per day, and 100-200 mg (4-8 tablets) (25-50 mg or 1-2 tablets each time) per day of oral thalidomide (Changzhou Pharmaceutical Factory Co. Ltd., H32026129).

2.2.2. Study group

The study group was treated with oral lenalidomide (Jing Shuanglu Pharmaceutical Co., Ltd., GZP H20170011), with a dose of 25 mg once daily on days 1-21 of each repeated 28-day cycle until disease progression; intravenous cyclophosphamide (Jiangsu Shengdi Pharmaceutical Co., Ltd., GZP H32024654) at 500-1000 mg/m² per dose according to body surface area (1000 mg/m² with 20-30 ml of saline, intravenously, once a week for 2 times, repeated after a 1- to 2-week break); and oral dexamethasone (Guangdong Huainan Pharmaceutical Group Co., Ltd., Guodianzhi H44024469), with a starting dose of 0.75-3.00 mg (1-4 tablets) once, 2-4 times a day for adults, and a maintenance dose of approximately 0.75 mg (1 tablet) a day but depending on the patient's condition.

2.3. Observation indicators

(1) Effectiveness of treatment

“Effectiveness” was determined based on patients' physiological indicators and their symptoms. Comparing the treatment effectiveness of both the groups, the patients were categorized into three groups: very effective, effective, and ineffective.

(2) Adverse effects

The adverse effects in terms of changes in blood composition, weakness, and neuropathy were compared between the two groups

(3) Clinical indices

The pain index, serum β 2-microglobulin, urine β 2-microglobulin, and erythrocyte sedimentation rate before and after treatment were compared between the two groups.

3. Results

3.1. Effectiveness of treatment

The difference in the effectiveness of treatment between the control group and the study group was statistically significant ($p < 0.05$), as shown in **Table 1**.

Table 1. Comparison of treatment effectiveness between the two groups (n, %)

Group	Number of cases	Very effective	Effective	Ineffective	Treatment effectiveness
Study group	30	24 (80.00)	6 (20.00)	0 (0.00)	30 (100.00)
Control group	30	20 (66.67)	5 (16.67)	5 (16.67)	25 (83.33)
X ²					5.4545
p					0.0195

3.2. Adverse effects

The incidence of changes in blood composition, weakness, and neuropathy was significantly lower in the study group than the control group ($p < 0.05$), as shown in **Table 2**.

Table 2. Comparison of adverse effects between the two groups (n, %)

Group	Number of cases	Changes in blood composition	Weakness	Neuropathy	Incidence rate
Study group	30	0	1	0	1 (3.33)
Control group	30	1	3	2	6 (20.00)
X ²					4.0431
p					0.0444

3.3. Clinical indices before and after treatment

Before treatment, there was no significant difference in terms of pain index, serum $\beta 2$ -microglobulin, urine $\beta 2$ -microglobulin, and erythrocyte sedimentation rate between the two groups ($p < 0.05$); however, after treatment, the pain index, serum $\beta 2$ -microglobulin, urine $\beta 2$ -microglobulin, and erythrocyte sedimentation rate of the study group were significantly better than those of the control group ($p < 0.05$), as shown in **Table 3**.

Table 3. Comparison of clinical indices before and after treatment (n = 30, \pm s)

Group	Number of cases	Pain index		Serum $\beta 2$ -microglobulin	
		Pre-treatment	Post-treatment	Pre-treatment	Post-treatment
Control group	30	6.55 \pm 1.26	4.13 \pm 0.57	3.35 \pm 0.65	2.26 \pm 0.53
Study group	30	6.30 \pm 1.58	3.02 \pm 0.18	3.30 \pm 0.52	1.67 \pm 0.53
t		0.6776	10.1711	0.3290	4.3114
p		0.5007	0.0000	0.7433	0.0001
Group	Number of cases	Urine $\beta 2$ -microglobulin		Erythrocyte sedimentation rate	
		Pre-treatment	Post-treatment	Pre-treatment	Post-treatment
Control group	30	1.55 \pm 0.26	1.03 \pm 0.07	35.95 \pm 3.05	24.26 \pm 3.03
Study group	30	1.50 \pm 0.58	0.42 \pm 0.08	34.94 \pm 3.02	17.27 \pm 2.03
t		0.4309	31.4305	1.2889	10.4974
p		0.6682	0.0000	0.2026	0.0000

4. Discussion

Multiple myeloma has no known etiology; however, it might be related to radiation, genetics, or genetic mutations. Patients with multiple myeloma have abnormal M protein in the blood as well as pathological fractures and bone lesions found on imaging [11-14]. Multiple myeloma is a malignant disease of the

hematological system, in which there is substantial increase in primitive and naive plasma cells in the bone marrow as well as inhibition of normal hematopoietic function [15-19]. These plasma cells may secrete abnormal immunoglobulins, which can cause multiple osteolytic lesions and kidney damage. Chemotherapeutic agents or targeted drugs are often used in the treatment of multiple myeloma. Lenalidomide is currently the most common drug used for the treatment of multiple myeloma because it is safe, has a relatively low risk of adverse effects, and is effective in boosting the immune system. Cyclophosphamide is an alkylating agent that, when used, is effective in removing cancer cells from the body. Dexamethasone, on the other hand, has a good anti-inflammatory and anti-toxic effect. Hence, the combination of the three is ideal [20]. In this study, the difference in the effectiveness of treatment between the control group and the study group was statistically significant ($p < 0.05$); the incidence of changes in blood composition, weakness, and neuropathy in the study group was significantly lower than that in the control group ($p < 0.05$); although there was no significant difference in terms of pain index, serum β 2-microglobulin, urine β 2-microglobulin, and erythrocyte sedimentation rate between the two groups before treatment ($p < 0.05$), the pain index, serum β 2-microglobulin, urine β 2-microglobulin, and erythrocyte sedimentation rate of the study group were significantly better than those of the control group after treatment ($p < 0.05$).

In conclusion, lenalidomide combined with cyclophosphamide and dexamethasone is effective in the treatment of patients with multiple myeloma and is worth promoting.

Disclosure statement

The author declares no conflict of interest.

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