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A Study on the Effectiveness of Decitabine Combined with a Half-Dose Priming Regimen in the Treatment of Elderly Patients with Acute Myeloid Leukemia

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Abstract: *Objective:* To investigate the clinical effects of combining decitabine with a half-dose priming regimen in the treatment of elderly patients with acute myeloid leukemia. *Methods:* This study was conducted in Shaanxi Provincial People's Hospital from January 2019 to January 2022. Sixty patients were recruited as the research subjects. The patients received different treatments and were randomly divided into two groups, with 30 cases in each group, one of which was treated with conventional priming regimen (control group), and the other was treated with decitabine combined with a half-dose priming regimen (study group). The two groups were compared and analyzed in terms of the effectiveness of treatment. *Results:* The rate of symptom relief in the study group was 96.67%, which was significantly higher than that in the control group (76.67%) ($p < 0.05$). Before treatment, there was no significant difference in the quality-of-life scores between the two groups, with $p > 0.05$. The patients in the study group had significantly longer disease-free survival and overall survival than those in the control group, with $p < 0.05$. The effectiveness of treatment in the study group was also better. *Conclusion:* The use of decitabine in combination with a half-dose priming regimen for the treatment of elderly patients with acute myeloid leukemia is effective in improving patients' quality of life, relieving symptoms, and prolonging their survival.

Keywords: Decitabine; Half-dose priming regimen; Elderly; Acute myeloid leukemia

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1. Introduction

Acute myeloid leukemia is a malignant clonal disease that involves myeloid hematopoietic stem cells. It can be manifested as anemia, fever, bleeding and infection of the skin and mucous membrane, as well as bone and joint pain, thus having significant impact on patients' health and quality of life [1-4]. In clinical practice, it is important to take into account of the patient's underlying disease condition when formulating a treatment plan that is both effective and safe. This method was first proposed by Japanese scholars, and it consists of two main chemotherapeutic regimens, one of which is a priming regimen using aclarubicin, cytarabine, and granulocyte colony-stimulating factor, and the other is also a priming regimen that uses idarubicin, cytarabine, and granulocyte colony-stimulating factor [5-9]. Since there is a gradual decline in the physical functioning of elderly patients, and they are known to have lower tolerance to chemotherapy regimens, half-dose priming regimens are now widely used in clinical practice [10-13]. In this study, decitabine was used in combination with a half-dose priming regimen to compare and analyze the effects

of this clinical intervention in elderly AML patients.

2. Materials and methods

2.1. General information

This study was carried out in Shaanxi Provincial People's Hospital from January 2019 to January 2022, with a total of 60 cases of elderly acute myeloid leukemia patients. The patients were given different treatments and divided into two groups (study group and control group), with 30 cases in each group. In the study group, there were 16 male patients and 14 female patients, age ranging from 61 to 88, with a mean age of 74.34 ± 4.34. In the control group, the number of male patients and the number of female patients were 17 and 13, respectively, with age ranging from 60 to 88, and a mean age of 74.05 ± 4.55. However, it is known that there are only a few dozens of leukemia cases every year, with older cases accounting for only a handful of them. Statistical methods were used to compare and analyze the general data of the two groups of patients, and the results all showed $p > 0.05$, with no significant differences, thus meeting the criteria for a comparative study.

Inclusion criteria: (1) patients diagnosed with acute myeloid leukemia after clinical examination; (2) patients above 60 years of age; (3) those who agreed to participate in the study with informed consent taken. This study was approved by the hospital ethics committee.

Exclusion criteria: (1) patients who survived for less than 3 months; (2) patients who have severe liver and renal insufficiency or other conditions; (3) patients who withdrew from the study or with poor compliance.

2.2. Methods

In the control group, CAG and IAG regimens were used, of which 29 patients were treated with the CAG regimen, while 21 patients were treated with the IAG regimen. Aclarubicin was administered on the first day of chemotherapy at a dose of 20 mg via intravenous injection and given every other day for a total of four treatments. For cytarabine, 10 mg/m^2 was administered via subcutaneous injection on the first day of chemotherapy every 12 hours for a total of 14 consecutive days. Granulocyte colony-stimulating factor was also administered via subcutaneous injection on the first day of chemotherapy at a dose of 200 mcg/m2, once a day for 14 days, with observation and discontinuation of the drug when the white blood cell count reached 20 x 10^9/L. Under the IAG regimen, the main drugs used were idarubicin, cytarabine, and granulocyte colony-stimulating factor. The dosage and administration of cytarabine and granulocyte colony-stimulating factor were the same as those in CAG regimen. For idarubicin, 5 mg was administered intravenously once a day for six days, beginning on the first day of chemotherapy.

In the study group, decitabine was administered intravenously on the first day of chemotherapy at a dose of 20 mg/m^2 over 3 hours, once daily for 5 days. In addition to that, half-dose priming regimens were used (half-dose CAG regimen and half-dose IAG regimen). Twenty-nine patients were treated with half-dose CAG regimen, while 21 patients were treated with half-dose IAG regimen. The half-dose CAG regimen (cytarabine, aclarubicin, and granulocyte colony-stimulating factor) was used over one cycle of chemotherapy. Aclarubicin was administered on the first day of chemotherapy at a dose of 20 mg via intravenous injection and given every other day for a total of two treatments. Cytarabine, which needs to be started on the first day of chemotherapy, was administered via subcutaneous injection at a dose of 10 mg/m^2; the intervention was given every 12 hours for a total of seven consecutive days. Granulocyte colony-stimulating factor was also administered via subcutaneous injection on the first day of chemotherapy at a dose of 200 mcg/m^2; it was given as a daily intervention for a total of seven consecutive days. Patients on half-dose IAG regimen over one cycle of chemotherapy were treated with idarubicin, cytarabine, and granulocyte colony-stimulating factor. The drugs were administered at the same dosage and in the same

manner as the latter two drugs used in the half-dose CAG regimen. Idarubicin was administered intravenously on the first day of chemotherapy at a dose of 5 mg; the intervention was given once a day for three consecutive days, with patients in both groups receiving two consecutive cycles of chemotherapy.

2.3. Observed indicators

The remission of symptoms in the two groups was evaluated. Complete remission, partial remission, and no remission were the three categories. Complete remission refers to the total disappearance of clinical symptoms and the return of normal neutrophil count, platelet count, and megakaryocyte count after treatment; partial remission refers to the improvement of clinical symptoms and various test indicators after treatment; no remission refers to no significant changes in any symptoms before and after treatment. The exclusion rate is the total effective rate of this study.

The quality of life of the two groups was compared, using the Quality of Life Scale, wherein the higher the score, the better the quality of life [14].

The durations of disease-free survival and overall survival after treatment were recorded and compared between the two groups.

2.4. Statistical analysis

SPSS 20.0 was used to analyze the data. The measurement data were expressed in ($\bar{x} \pm s$), while the calculation data were expressed in [n (%)]. After calculation, validation was achieved using t-values and 2 values, respectively. The results were observed and compared, with $p < 0.05$ indicating statistically significant results.

3. Results

3.1. Symptom relief

The rate of symptom relief in the study group was 96.67%, which was significantly higher than that in the control group (76.67%) ($p < 0.05$), as shown in **Table 1**.

Table 1. Comparison of symptom relief between the two groups [n (%)]

Group	Complete remission	Partial remission	No remission	Rate of symptom relief
Study group (n = 30)	21 (70.00)	8 (26.67)	1 (3.33)	29 (96.67)
Control group (n = 30)	8 (26.67)	15 (50.00)	7 (23.33)	23 (76.67)
χ^2				5.192
p				0.023

3.2. Quality of life

Before treatment, there was no significant difference in the quality-of-life scores between the two groups, $p > 0.05$. After treatment, the scores improved, but the scores of the study group were significantly higher than those of the control group, with a large difference from data comparison, $p < 0.05$, as shown in **Table 2**.

Table 2. Comparison of quality-of-life scores between the two groups ($\bar{x} \pm s$)

Group	Quality of life scores	
	Before treatment	**After treatment**
Study group (n = 30)	43.13 ± 0.22	90.45 ± 0.32
Control group (n = 30)	43.29 ± 0.54	78.56 ± 0.67
t	1.503	87.710
p	0.138	0.000

3.3. Survival time

When compared with the control group, the patients in the study group had longer disease-free survival and overall survival than the control group, and the differences from the data comparison were all statistically significant, $p < 0.05$, as shown in **Table 3**.

Table 3. Comparison of disease-free survival and overall survival between the two groups ($\bar{x} \pm s$)

Group	Disease-free survival	Overall survival
Study group (n = 30)	12.55 ± 1.43	19.54 ± 2.65
Control group (n = 30)	6.45 ± 2.10	13.22 ± 2.67
t	13.151	9.202
p	0.000	0.000

4. Discussion

Acute myeloid leukemia is a malignant clonal disease of the hematopoietic system with high clinical incidence and a growing prevalence in recent years [15-18]. Age is one of the factors that contribute to the development of this disease. Generally, elderly people have reduced physical functioning, which plays a part in increasing the incidence of this disease. Alcohol abuse and smoking are also major influencing factors in the development of this disease [19]. The current clinical development in the treatment of this condition is directed to the priming approach [20]. Although this method is effective, it is not suitable for elderly patients because their bodies are weak and their functions are declining, which result in a lower tolerance. Furthermore, the use of priming regimens can easily lead to various adverse reactions that threaten patients' health [21,22]. Decitabine is a major drug for the treatment of malignant tumors, and it has effective clinical application. When combining this drug with priming regimens, the dose used in priming regimens can be reduced, for example, a half-dose priming regimen can be used. This will help reduce the adverse effects experienced by patients, promote recovery, and improve patients' tolerance.

In conclusion, the use of decitabine in combination with a half-dose priming regimen in the treatment of elderly patients with acute myeloid leukemia is effective in terms of improving the quality of survival, relieving symptoms, and prolonging the survival of patients, which is significant and should be promoted.

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Disclosure statement

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