Multidisciplinary Collaborative Model and Diagnostic Clustering Algorithm in Pathology Clinical

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Abstract: Exploring the application value of multidisciplinary collaborative diagnosis and treatment mode in pathology, the cluster analysis method was used to select a certain number of patients. According to the random number Table method, the patients were divided into MDT group and control group. The control group received routine intervention, and the group gave mode intervention on this basis. There were no deaths in the group and the control group. The satisfaction rate of the group was significantly higher than that of the control group ($P < 0.05$). There were statistical differences. Conclusion MDT mode intervention can effectively alleviate the negative emotion of patients, reduce the amount of bleeding, blood transfusion and postoperative complications in patients undergoing cesarean section, which is beneficial to the patient's physical recovery and improve the satisfaction of diagnosis and treatment.

1. Introduction

The effect of chemotherapy combined with surgical treatment in the multi-disciplinary team (MDT) diagnosis mode has been widely recognized, especially in patients with rectal cancer [1]. To further explore the clinical significance of this comprehensive treatment, the MDT team conducted a randomized controlled trial of chemotherapy combined with surgical treatment between November 2017 and March 2018 [2]. The comprehensive treatment group needs to sign and agree to a comprehensive treatment.

Cluster analysis, also known as cluster analysis, is a multivariate statistical method that classifies things differently according to the similarity and dissimilarity between things [3]. The central idea is that things are gathered together, people are divided into groups. The cluster analysis mainly judges whether the individual has an aggregation phenomenon by the distance and similarity of the distance, so as to scientifically and objectively classify the individual, and the research on the law of Chinese medicine is obviously assisted [4].

This study explores the clinical drug use aggregation phenomenon by cluster analysis of clinical prescription drugs, and finds its objective drug use law, and combines academic thoughts to test the law of treatment methods. First, frequency and frequency statistics are performed on patients of different types of patients. Then, use SPSS19. 0 Organize the data and perform frequency analysis on the collected data. Cluster analysis can classify some similar data in the data into a class [5], and classify some alienated into different classes to find ICG characteristics of patients of different ages.

2. Materials and Methods

2.1. Collection and recruitment of data

All the data collected in this subject are statistically analyzed by SPSS 22.0. The count data is described by chi-square test, which is described by frequency, percentage or composition ratio. The measurement data is firstly tested by KS test ($P>0.05$ is established) [6]. If it is a uniform distribution or (approximate) normal distribution with variance and standard deviation description, t test or chi-square test is used according to the grouping situation and analysis content ($P<0.05$ means the difference is statistically significant), if it is skewed distribution Quartile spacing description; systematic cluster analysis was used for multiple indicators in the four diagnostic

information of Chinese medicine, and the skewed distribution data of different groups were analyzed by Kruskal-Wallis rank sum test (P<0.05 means the difference was statistically significant) [7].

The clinical data collection is completed, the complete and reliable cases are sorted and screened, and then the data is checked and entered by two members to ensure the accuracy and objectivity of the data. As shown in Table 1 below.

Table 1 Gender and age distribution

Age	Frequency	Composition	Male		Female	
			Frequency	percentage	Frequency	percentage
<50	5	4.6	2	2.75	2	1.846
51-59	16	14.8	9	7.34	9	7.36
60-69	28	25.6	15	14.69	11	11.00
70-79	35	32.0	12	10.00	25	22.00
>80	24	22.9	16	13.78	9	9.15
Total	108	100	53	48.63	56	51.36

A total of 109 cases were included in the study, including 53 male patients, accounting for 48.6% of the total; 56 female patients, accounting for 51.4% of the total; a normal distribution test for age, with an average age of 70.12 years, the smallest the age of 42 years old, the maximum age of 95 years, according to a ladder every 10 years old, the age is divided into ≤ 49 years old, 50-59 years old, 60-69 years old, 70-79 years old and ≥ 80 years old total 5 groups. The age distribution is mainly concentrated in the population of 60 years old and above, accounting for 80.7% of the total number of cases; among them, the age group of 70-79 years old is the total, 35 people, accounting for 32.1% of the total number. Table 2 shows the t test of gender and age distribution.

Table 2 Gender distribution of gender and age

gender	Number of cases	Age	Minimum age	Maximum age	p value
Male	54	69.38±11.3	46	96	0.6.1
Female	57	70..78±11.6	43	97	

As can be seen from Table 2, the male-female ratio is slightly different in the 70-year-old and above, but the independent sample t-test, P=0.508, significantly>0.05, indicating the age difference of different genders of patients with CSBD complicated cognitive impairment in this study [8]. Not statistically significant.

2.2. MDT Team Information Center Framework

MDT Information Center not only needs to improve clinical functions, strengthen computer-aided clinical functions, but also further improve the functions of organization management and services. On the basis of realizing the storage and integration of massive information, it is also necessary to facilitate team discipline information [9]. At the same time, for the MDT Information Center, in order to facilitate the exchange of people, it is necessary to carry out some cultural expansion, such as the member exchange area. To this end, the overall framework of the MDT Information Center should include information collection and processing, knowledge management sharing, collaboration and team management functions, as shown in Figure 1.
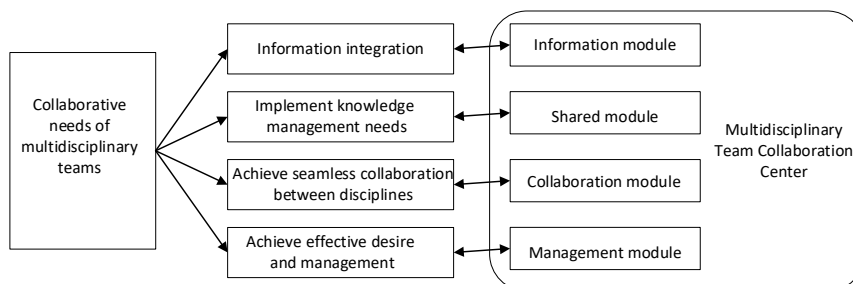

Fig.1. Multidisciplinary Team Information Center

This information center can not only realize information release, document management, collaborative consultation, experimental recording, member exchange, scientific research interaction, but also through resource integration, the resource planning, consumable demand planning and supply chain management systems in the MDT team can be carried out. Adhere to the training seminar every Monday night: as of February 28, 2018,

A total of 108 in-house academic leaders and experts were invited to give lectures. The main content of the lectures was monitoring technology and drugs. The satisfaction of trainers reached 91.4%, and the satisfaction of each specialist was 95.6%. the total number of participants per month is shown in Figure 2.
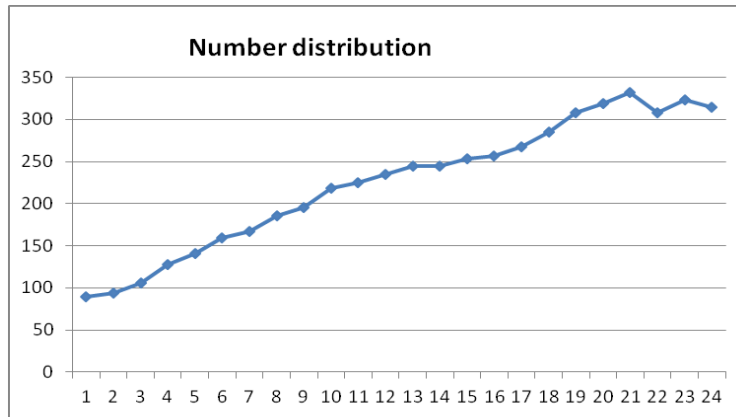

Fig.2. Distribution of the number of guardianship centers

2.3. Cluster analysis

The core of clustering information sub-clustering is the distance definition, which can be divided into cohesion method and split method according to the way. The cohesion method starts from a single object and continuously merges the groups that satisfy the distance definition until all of them are combined into one group. Because both processes can be represented by a tree diagram, they are also called tree clustering. The above various clustering analysis algorithms need to measure the similarity of data objects, and usually measure the similarity by distance quantization. For any data object $p = [p_1, p_2, \wedge \cdots p_m]$ and $q = [q_1, q_2, \wedge \cdots q_m]$. Minkonwski distance is shown in Equation 1 [10].

$$d_x(p,q) = [\sum_{i=1}^{m} | p_i - q_i |^x]^{\frac{1}{x}} \tag{1}$$

Think of Minkonwski distance as a collection of infinite distance metrics. The value of transform x can be defined by different distances. The Manhattan distance when x=1. The specific definition is shown in Table 3.

Table 3 Distance metric expression

Distance measure	Expression of distance
Manhatan distance	$d_1(p,q) = \sum_{i=1}^{m} | p_i - q_i |$
European distance	$d_2(p,q) = \sqrt{\sum_{i=1}^{m} | p_i - q_i |^2}$
Chebyshev distance	$d_\infty(p,q) = \underset{1 \le i \le m}{mas} | p_i - q_i |$

It is assumed that the transaction data set D contains a plurality of transactions T, each of which is not less than one item, and a plurality of items constitute a set of items, as shown in Equations 2 and 3 [11].

$$\sup(X) = p(X) = \frac{\text{The total number of X occurrences}}{\text{Total number of things}} \qquad (2)$$

$$Conf(Y/X) = p(Y/X) = \frac{\text{The total number of XY occurrences}}{\text{The total number of X transactions}} \qquad (3)$$

3. Test results

Figure 3 shows that the difference in scores between time point 1 and time point 2 is not statistically significant (p>0.05), and the difference between time point 1 and time point 3, time point 2 and time point 3 is statistically significant (p<0.05) [12]. To a certain extent, it reflects the long-term training of the center, the professional knowledge of the medical staff and the records of the consultation work of the center, and the patients who are diagnosed and treated by MDT in the hospital intensive care collaboration center are mainly patients with multiple diseases and critically ill patients, and In the first department, there is no effective treatment, the patient has a long hospital stay, the hospitalization cost is high, the medical safety is high, and the incidence of hospital infection and the incidence of surgical wound healing are high. The outcomes of patients with MDT diagnosis and treatment were compared with those of other ICU patients in the hospital.
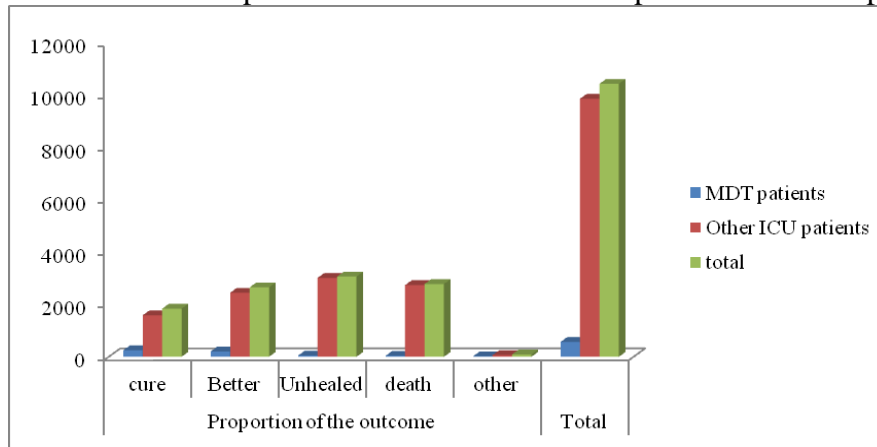

Fig.3. Comparison of the outcomes of multidisciplinary patients and others

The average hospitalization day of the ICU is the total number of days of hospitalization. Figure 4 shows the comparison of clinical indicators of three major ICUs.
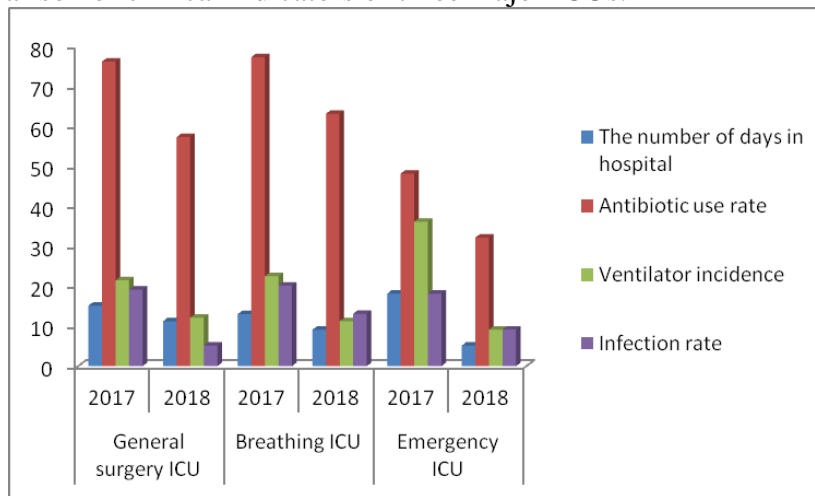

Fig.4. Comparison of clinical indicators of three major ICUs in different years

4. Conclusion

This article applies the MDT model, with the leader of the team as the core, the attending doctor

and the responsible nurse as the foundation. The comprehensive reference dietitian and MDT model have become an important working mode for the treatment of diseases in large hospitals and an important part of the medical system. The results of this study showed that patients in the observation group were more informed than the control group ($P < 0.01$) after intervention with the MDT model. This shows that the MDT assisted group has provided centralized intervention and decentralization to provide specialized interventions for patients, which can maximize the patient's awareness of the disease, so that it can grasp the nursing points and coordination points of the disease from various fields. In summary, the implementation of multidisciplinary team collaboration nursing mode can improve patients' cognitive level of disease and improve their adverse psychological status, which is worthy of clinical application.

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