Application of Intelligent Management Mode of Cardiac Rehabilitation in Patients Undergoing Coronary Artery Bypass Grafting

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Abstract: To observe the effect of intelligent management mode of cardiac rehabilitation in patients with coronary artery bypass grafting. From May 2023 to October 2024, 70 patients with coronary artery bypass grafting in our hospital were selected and divided into two groups according to the random sampling grouping method. One group carried out routine management (35 cases, control group), and the other group carried out cardiac rehabilitation intelligent management mode (35 cases, observation group). The cardiac function level, exercise endurance and self-care ability of patients during recovery were compared. The level of cardiac function in the observation group was higher than that in the control group, P<0.05. The self-care ability of the observation group was higher than that of the control group, P<0.05. The intelligent management mode of cardiac rehabilitation for patients undergoing coronary artery bypass grafting can promote the recovery of cardiac function and improve the self-care ability of patients.

Keywords: Intelligent Management Mode of Cardiac Rehabilitation; Coronary Artery Bypass Grafting; Cardiac Function

1. Introduction

Coronary artery bypass grafting has a high implementation rate in clinical practice, plays an important role in the treatment of patients with heart disease, and can promote the recovery of patients [1-2]. Due to the large trauma of the operation and the slow recovery of patients, in order to promote the recovery of patients' damaged cardiac function, it is necessary to timely guide patients to carry out cardiac function rehabilitation training on the basis of improving the postoperative medication scheme [3]. The intelligent management mode of cardiac rehabilitation is a new measure to carry out cardiac function rehabilitation training for patients with coronary artery bypass grafting. This study mainly studies the specific value of this management mode.

2. Materials and Methods

2.1 General Information

Methods: 70 patients with coronary artery bypass grafting in our hospital from May 2023 to October 2024 were selected and divided into two groups according to random sampling method. One group was given conventional management (35 cases, control group), and the other group was given intelligent management mode of cardiac rehabilitation (35 cases, observation group). In the control group, there were 18 males and 17 females, aged from 51 to 78 years, with an average of (65.63 ± 1.75) years. The body mass index was 22-25kg/m2, with an average of (23.25 ± 0.47) kg/m2. There were 19 males and 16 females in the observation group, aged from 53 to 77 years, with an average of (64.68 ± 1.15) years. The body mass index ranged from 22 to 24 kg/m2, with an average of (22.74 ± 0.68) kg/m2. For the comparison of two groups of basic data, P>0.05.

2.2 Method

The control group received routine observation during the recovery process. The medical staff should patiently explain the problems needing attention in the recovery process for the patients, guide the patients to use medicine scientifically, and actively participate in exercise. The patients in the observation group need to accept the intelligent management mode of cardiac rehabilitation during the recovery process: (1) remote monitoring and management. During the recovery of patients

with coronary artery bypass grafting, it is necessary to guide patients to wear relevant rehabilitation monitoring equipment or mobile health app, accurately evaluate the changes of various indicators of patients, and analyze whether there are abnormalities in blood pressure, heart rate and other indicators. The medical staff in the hospital can timely obtain the basic vital signs data of patients and understand the recovery of patients. The medical staff in the hospital can timely provide online guidance to the patients in combination with the recovery of the patients, help the patients to further clarify the problems needing attention in the recovery process, and promote the patients to master the correct rehabilitation training methods. (2) Personalized rehabilitation program development. Medical staff in the hospital can combine the monitoring of patients' daily health status and analyze it through artificial intelligence technology or big data to develop more targeted rehabilitation training programs for patients and promote the pertinence of rehabilitation training for patients during recovery. (3) Application of intelligent rehabilitation equipment. During the recovery of patients, the cardiac rehabilitation exercise system or external counterpulsation therapy instrument are used to assist the patients with rehabilitation training to help the patients recover their cardiac function. And this part of the equipment can strictly manage the training intensity and frequency in combination with the changes of patients' cardiac function, so as to ensure the safety of patients in the training process.

The patients in the two groups received continuous nursing intervention for 8 weeks.

2.3 Observation Index
(1) Comparison of cardiac function level. Before and after nursing, cardiac ultrasound diagnostic instrument (Xuzhou desumai Electronic Technology Co., Ltd., model kr-c60) should be used to evaluate the recovery of cardiac function, and the measurement indexes include left ventricular end diastolic diameter and left ventricular end systolic diameter. (2) Self care ability comparison. The self-care ability of patients during recovery was evaluated according to the self-management ability assessment (ESCA), which was evaluated from four levels: self responsibility (0-32 points), management skills (0-48 points), self-concept (0-36 points) and health knowledge (0-56 points). The higher the score, the better the self-care ability of patients.

2.4 Statistical Methods
All aspects of data in the study were analyzed according to spss22.0. The percentage was expressed as count data, chi square test, and the measurement data was expressed as mean $\pm$ standard deviation, t-test, $p<0.05$, with statistical significance.

3. Result

3.1 Comparison of Cardiac Function Levels
The level of cardiac function in the observation group was higher than that in the control group after nursing, $P < 0.05$, see Table 1.

Table 1. Comparison of Cardiac Function Levels Between the Two Groups（$\bar{x} \pm s$）

Peer Group	Case Number	Left Ventricular End Systolic Diameter (mm)		Left Ventricular End Diastolic Diameter (mm)	
		Before Nursing	After Nursing	Before Nursing	After Nursing
Observer Group	35	50.56±2.15	37.45±2.15	52.36±2.26	42.05±1.74
Control Group	35	50.45±2.25	44.45±2.35	52.41±2.34	51.05±1.68
t	-	0.163	26. 045	0.182	22.045
P	-	0.871	<0. 001	0.856	<0.001

3.2 Comparison of Self-care Ability Between the Two Groups

The self-care ability of the observation group was higher than that of the control group, $P<0.05$, See Table 2.

Table 2. Comparison of Self-care Ability Between the Two Groups（$\bar{x} \pm s$）

Peer Group	Case Number	Self Responsibility		Management skills		Self Concept		Psychology	
		Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing
Observer Group	35	18.78±1.75	29.05±1.32	29.15±2.25	38.65±1.4	22.26±2.24	31.68±1.32	30.11±1.45	41.74±1.74

Control Group	35	18.99±1.65	23.15±1.45	30.35±2.34	34.22±1.35	22.34±2.05	26.42±1.75	30.21±1.44	34.35±1.75
t	-	0.201	20.111	1.896	15.867	0.356	18.802	0.328	26.752
P	-	0.841	<0.001	0.061	<0.001	0.723	<0.001	0.744	<0.001

4. Discussion

Coronary artery bypass grafting is the main clinical treatment for patients with coronary heart disease and myocardial ischemia. Under the effect of this surgical scheme, it can promote the rapid recovery of myocardial blood supply and improve the cardiac function of patients [4-5]. However, the operation is relatively traumatic, and the postoperative recovery of patients is relatively slow. In order to comprehensively ensure the clinical treatment effect of patients with coronary artery bypass grafting, it is necessary to do a good job in all aspects of management in the process of patient recovery.

The intelligent management mode of cardiac rehabilitation is a new mode of clinical rehabilitation management for patients with heart disease. Through the application of intelligent facilities, the changes of patients' condition can be observed more accurately in the process of patients' recovery. Medical staff can adjust all aspects of rehabilitation training measures according to the actual situation of patients, increase the pertinence of rehabilitation training, and promote the recovery of patients [6]. At the same time, under the role of intelligent management mode of cardiac rehabilitation, pay close attention to the recovery of patients, and medical staff carry out online guidance in time, which can increase the timeliness of rehabilitation management and help patients recover. Combined with this observation, it can be seen that the intelligent management mode of cardiac rehabilitation can promote the improvement of cardiac function level of patients with coronary artery bypass grafting, and increase the self-care ability of patients, which can comprehensively guarantee the management effect of this part of patients.

Comprehensive research shows that the intelligent management mode of cardiac rehabilitation can be used in the process of rehabilitation management of patients with coronary artery bypass grafting to promote the recovery of patients.

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