Program for elderly patients with acute heart failure through intervention by interdisciplinary team to prevent disability

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Program for elderly patients with acute heart failure through intervention by interdisciplinary team to prevent disability

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Abstract

Objectives: This study was performed to develop a program through intervention by interdisciplinary team to prevent disability of elderly patient with acute heart failure before and after hospitalization and to determine its usefulness.

Methods: The subjects were 25 patients aged 75 and above (10 in the intervention group 15 in the control group) with acute heart failure. The subject hospital was an acute care hospital and had not obtained approval to function as a cardiac rehabilitation facility. The program consists of conference by interdisciplinary team, nursing care plan, and exercise training. To evaluation of this program, disability, treatment and care, lower extremity functional capability as the evaluation index.

Results: 1. The intervention group did not show a significant decrease at the time of discharge compared to the baseline, while in the control group cognitive function and basic ADL were significantly decreased. **2.** No differences were observed between the two groups in the length of hospital stay, intravenous drip, catheter in the bladder, body restraint, but all of these tended to be shorter in the intervention group. All the subjects in the intervention group were able to return to their home from the hospital. However, 8 patients (53%) in the control group returned home. **3.** The decrease in muscle thickness in the intervention group was approximately double that in the control group. Femoral circumference showed a significant decrease in both groups.

Conclusion: A hospitalization program was developed with a team approach through interventions by interdisciplinary team for elderly patient with acute heart failure. This program can be incorporated in hospitals that have not obtained approval to function as a cardiac rehabilitation facility. The results of the present study indicated that this is a safe and sustainable program for maintenance of disability for elderly patients with acute heart failure from the early stage of hospitalization.

Key words

acute heart failure, elderly patient, disability, interdisciplinary team, program evaluation

Introduction

The incidence of heart failure increases with age, and has a high frequency over the age of 75[1]. Disuse syndrome is likely to occur due to prolonged bed rest, especially in elderly patients, which tends to reduce activities of daily living (ADL)[2]. Elderly patients with acute heart failure suffer from dyspnea on exertion and edema of the extremities, and therefore their activities become limited. In association with sudden hospitalization, elderly patients often experience lowered motivation caused by the change in the environment and bed

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rest, delirium, and cognition disorder[3]. Therefore; medical care for elderly patients requires prevention of disability as well as treatment of disease.

In Japan, exercise training for the stable phase of heart failure is classified as Class I based on the Guidelines for Rehabilitation in Patients with Cardiovascular Disease (JCS2007)[4], which indicates that the therapy is recommended and is considered reliable and effective[5]. Moreover, the necessity of exercise training from earlier stages is increasing. However, it has been reported, mainly by physiotherapists, that the clinical condition of elderly patients with acute heart failure is diverse and is difficult to standardize[6]. Exercise training is often insufficient and there are problems with continuity. In addition, ADL and cognition disorder may already be decreased by the time exercise is started, and thus earlier intervention and a comprehensive team approach through interdisciplinary coordination is required[7-9]. However, there are few studies that specify a program through intervention by interdisciplinary team to prevent disability of elderly patient with acute heart failure and to demonstrate its usefulness.

This study was performed to develop a program through intervention by interdisciplinary team to prevent disability of elderly patient with acute heart failure before and after hospitalization and to determine its usefulness.

Methods

1. Study design

Quasi-experiment study

2. Subjects

The subjects were acute heart failure patients aged 75 and above hospitalized in the subject hospital from May 1, 2009 to April 30, 2010. Written consent was obtained from the patient or a family member. All of the subjects were able to rise from bed and walk on their own with the help of a cane or hand railing 2 weeks prior to hospitalization. Clearance for participation in the study was obtained from the patients' doctors. Patients with a respirator at the time of hospitalization were excluded from the study. The study population consisted of 10 patients in the intervention group (participating in the program through interventions by interdisciplinary team from November 1, 2009 to April 30, 2010) and 15 in the control group (normal hospitalization care from May 1, 2009 to October 31, 2009). The intervention program was described to the intervention group at the time of hospitalization. The subject hospital is a general hospital (364 beds), and has serves as an acute care hospital. This hospital has 5 physicians specializing in cardiovascular internal medicine (of whom 4 are cardiologists), and there were 100 cases of acute heart failure in 2007. The subject hospital has not obtained approval to function as a cardiac rehabilitation facility.

3. Intervention strategy

In this study, we referred to an intervention study[10-14] involving interdisciplinary team to prevent disability in elderly patients in acute phase in the internal medicine ward, to develop a program by interdisciplinary team consisting of 3 essential parts: "team conference by a team of interdisciplinary team," "nursing care plan," and "exercise training".

As the intended subjects of the program are elderly patients with acute heart failure, we decided to create the program from the viewpoint of nursing care with the following considerations: (1) the program should contribute to prevent disability; (2) exercise training intervention in the early stages; (3) interventions that require immobility should be avoided; (4) adjustment to timing of hospital discharge should be performed from the early stages; and (5) information sharing between nurse and physiotherapist, and incorporation into the life of the hospital ward. Interdisciplinary team members consist of 1 cardiologist, 1 intensive care unit nurse, 1 cardiovascular ward chief nurse, 2 cardiovascular ward nurses, 1 physiotherapist, 1 clinical laboratory technologist (cardiac rehabilitation educator), and the author.

Normal hospitalization care places priority on the treatment of acute heart failure and bed rest in elderly patients with acute heart failure, and exercise training is started only when disability is observed. (Table 1)

Table 1. Contents of program of intervention with interdisciplinary team, and normal for elderly patients with acute heart failure

Program of intervention with interdisciplinary team	Program of normal
Team conference by interdisciplinary team	
Interdisciplinary team members are selected	
Rounding once a week	
5 to 10 minute conferences with patients and their family at bedside were held	
Disability condition (cognitive function, motivation, and basic ADL), examine treatment, care and exercise training condition through conferences	
Results of examination are reported to the physician	
Nursing care plan	Nursing care plan
Early ambulation by minimizing the period of bed rest (short placement of catheter retained in the bladder, and body restraint)	Program of normal places priority on the treatment of acute heart failure and bed rest
Information sharing between nurse and physiotherapist, and incorporation into the life of the hospital ward	The physician instructed bed rest and catheter retained in the bladder removal
Adjustment of discharge from the early stages	The physician decided adjustment of discharge
Reassessment of nesessary for sleep medication	
Exercise training	Exercise training
Within 48 h of hospitalization, the physician will make a request for exercise training to the physiotherapist	Exercise training is started only when disuse syndrome is observed
Performed based on stage classification with presence or absence of treatment (intravenous drip, oxygen)	The physiotherapist decided the training method
The exercise training was 10 to 30 minutes for once, 5 times a week	
Bed rest, ROM in bed	
Gatch up (45° −90°), Setting exercise	
Sitting upright, Extremity muscle strengthening and maintenance exercise	
Standing position, Training in standing up and transferring onto wheelchair in physiotherapy room	
Walking inside room, Walking training in physiotherapy room	
Walking in hospital ward	

4. Data collection

1) Overview of the subjects

The following information was obtained from the medical records at the time of hospitalization and discharge.

(1) Fundamental attributes: age, gender
(2) Underlying disease for heart failure
(3) Severity level: NYHA classification, left ventricle ejection fraction (LVEF) brain natriuretic peptide (BNP)

2) Evaluation of the effect of the intervention

(1) Evaluation index for conference by interdisciplinary team

Comprehensive Geriatric Assessment (CGA)[15] is a comprehensive method for evaluation of disability in the elderly that focuses on physical functioning, mental and neurological aspects, as well as social and environmental aspects, and its basic components consist of 6 items: cognitive function, motivation, depression, behavioral problems, basic ADL, and instrumental ADL. We used 3 items, *i.e.* , cognitive function, motivation, and basic ADL, in this study, which we believe to be the most important and most threatened functions in hospitalized elderly patients in the acute phase. In general, the basic ADL of acute heart failure patients is limited from the time of hospitalization depending on clinical condition and bed rest, and disability is predicted. In evaluating the effect of the intervention before and after hospitalization, we set the baseline as the condition 2 weeks before hospitalization, and with consideration of patients' condition in the acute exacerbation phase, a questionnaire study was administered among the patients' caregivers (family or care staff). The privacy of the patients was protected in conducting the interview. Thereafter, evaluation of disability was performed at the time of discharge.

① Cognitive function

The Nishimura style senile mental state scale (NM scale)[16] was used in this study. The NM scale consists of 5 items —household chores, interest, conversation, memory, and orientation— and is measured through observation. Each item is categorized in 7 grades from normal to most severe, and scores between 0 and 10 are given for

the severity of each item (normal: 50－48 points, borderline: 47－43 points, mild degree of dementia: 42－31 points, moderate degree of dementia: 30－17 points, severe: 16－0 points).

② Motivation

Vitality Index[17] was used in this study. Motivation related to the daily activities and behavior of the elderly subjects was measured through observation, and 5 items —rising from bed, communication, diet, excretion, and rehabilitation/activities— were measured through observation. Motivated received 2 points, and unmotivated received 0, with a total of 10 points; a score of 7 and below was considered unmotivated.

③ Basic ADL

Barthel Index[18] was used in this study. Ten items (diet, transfer, grooming, toilet use, bathing, walking on a flat surface, climbing stairs, dressing, bowel movement, and urination) were evaluated on a 3-point scale: independent, assistance partly required, full assistance required (completely independent: 100 points).

(2) Evaluation index for nursing care plan

The following information was obtained from medical records at the time of hospitalization and discharge. Average bed rest percentage was calculated from the bed rest condition observation record provided by the ward nurse.

① Treatment and care: length of the hospital stay, number of days the patient was on an intravenous drip, number of days the catheter was retained in the bladder, number of days of body restraint, average bed rest percentage {(total hours of bed rest during hospitalization/length of the hospital stay)/24 h ×100}

② Nutritional condition: serum albumin level, body mass index (BMI)

③ Background on patient life: presence of family caregiver, presence of someone living with the patient, residence before hospitalization and after discharge

(3) Evaluation index for exercise training

Lower extremities functional capability: muscle thickness, femoral circumference. Considering the clinical state of acute exacerbation at the time of hospitalization, a noninvasive, safe, and simple measurement method is required. A method to measure muscle thickness using ultrasound has recently been developed and its validity has been confirmed[19-21]. In this study, ultrasound was used to measure muscle thickness and femoral circumference at the time of hospitalization and discharge, and the values were compared. The method used for measurement of muscle thickness was the same as that described by Ikezoe et al.[20] and muscle thickness of the right quadriceps femoris muscle at rest were measured with ultrasonic diagnostic equipment (XARIO® XG SSA-680A; Toshiba). The patients were placed in the supine position, and muscle thickness measurement was performed from the anterior superior iliac spine to 1/3 and 3 cm outside of the distal superior margin of the patella. The femoral circumference was measured 10 cm above the superior margin of the patella, perpendicular to the longitudinal axis of the femur, with a measuring tape snug against the skin.

Each value was measured once to be used as data, and the measurements were done by a clinical laboratory technologist qualified as a cardiac rehabilitation educator.

5. Analysis method

In comparisons of characteristics factors between the two groups, Fisher's direct establishment method or normality was confirmed, and the Mann-Whitney U test was performed. For within-group comparisons of the values at the time of hospitalization and at the time of discharge, normality was confirmed, and then Wilcoxon's signed rank test was performed. For within-group comparisons regarding functional capacity of life between the baseline and the values at the time of hospitalization discharge, normality was confirmed and Wilcoxon's signed rank test was performed.

JMP6® statistical software was used for analysis. In all analyses, $p < .05$ was taken to indicate statistical significance.

6. Ethical considerations

We obtained approval from Kanazawa University (approval No.192) Medical Committee for Human Rights and the subject hospital. The participants were provided with a request form explaining to

Table 2. Overview of the subjects

			Intervention group (n=10)			Control group (n=15)			
	Items		Mean ± SD	n	%	Mean ± SD	n	%	p-value
Fundamental attributes	Age[a]		85.9 ± 5.0			80.3 ± 8.7			
	Gender[b]	Male		5	50		4	27	
		Female		5	50		11	73	
Underlying disease for heart failure[b]		Cardiac valve disease		4	40		2	13	
		Ischemic heart disease		1	30		4	27	
		Cardiac myopathy		2	20		1	7	
		Atrial fibrillation		3	10		6	40	
		Hypertension		0	0		2	13	
Severity level	NYHA classificationc at the time of hospitalization[b]	Ⅲ		6	60		13	87	
		Ⅳ		4	40		2	13	
	LVEF (%)[a]	At the time of hospitalization	39.7 ± 25.2			49.3 ± 17.7			
	BNP (pg/ml)[a]	At the time of hospitalization	916 ± 657.3			805.1 ± 562.1			

[a] Mann-Whitney test
[b] Fisher's exact test
LVEF: left ventricular ejection fraction
BNP: brain natriuretic peptide
SD: Standard deviation

the patient and their family members the aim, contents, data to be obtained, confidentiality, subject selection, that the setting of the program phase was done under the instruction of a cardiologist, that participation is voluntary, and that no disadvantage will arise from refusing to cooperate; written consent was obtained from all subjects prior to inclusion in the study.

Results

Twenty-five patients who agreed to participate in the study (10 in intervention group, 15 in control group) were included in the analysis. During the program, none of the participants quit the program or died.

1. Overview of the subjects (Table 2)

Average age of the subjects in the intervention group was 85.9 ± 5.0 yrs, and that in the control group was 80.3 ± 8.7 yrs; the difference between the two groups was not significant. The gender distribution in the intervention group was 5 males (50%) and 5 females (50%), and 4 males (27%) and 11 females (73%) in the control group. The preexisting diseases were as follows: cardiac valve disease ($n = 4$; 40%), atrial fibrillation ($n = 3$; 30%), cardiac myopathy ($n = 2$; 20%), and ischemic heart disease ($n = 1$; 10%) in the intervention group; and atrial fibrillation ($n = 6$; 40%), ischemic heart disease ($n = 4$; 27%), cardiac valve disease ($n = 2$; 13%), hypertension ($n = 2$; 13%), and cardiac myopathy ($n = 1$; 7%) in the control group. LVEF and BNP indicating the severity level were not significantly different between the two groups. LVEF and BNP were significantly decreased, and improvements were observed at the time of hospitalization discharge compared to the time of hospitalization in both groups.

2. Evaluation of the effect of the intervention

1) Evaluation of the team conference by interdisciplinary team (Table 3)

To evaluation of disability, 3 items (cognitive function, motivation, and basic ADL) were investigated. The average value of cognitive function decreased in both groups after in comparison to before hospitalization, and a significant decrease was observed in the control group. The average motivation decreased but the difference was not significant. Vitality index was 5.4 ± 1.8 points for the intervention group, and 4.8 ± 2.1 points for the control group at the hospitalization. Basic ADL in the intervention group was maintained in the following items: diet grooming, bowel movement, bathing, walking on a flat surface, and urination control. In the control group, all items decreased after in comparison to before hospitalization and significant decreases

Table 3. Evaluation index for conference by interdisciplinary team

		Intervention group (n=10)						Control group (n=15)					
		Baseline			At the time of discharge			Baseline			At the time of discharge		
Items		Mean ± SD	n	%	Mean ± SD	n	% p-value	Mean ± SD	n	%	Mean ± SD	n	% p-value
Cognitive function													
NM scale	Total	37.2 ± 11.4			36.8 ± 11.1			40.6 ± 10.1			37.1 ± 13.2		*
	Normal		2	20		1	10		4	27		1	7
	Borderline		2	20		2	20		5	33		6	40
	Mild degree of dementia		4	40		5	50		3	20		5	33
	Moderate degree of dementia		1	10		1	10		2	13		1	7
	Severe		1	10		1	10		1	7		2	13
Motivation													
Vitality Index	Total	9.4 ± 1.3			9.1 ± 1.4			9.7 ± 0.6			8.9 ± 2.8		
Basic ADL													
Barthei Index	Total	73.5 ± 28.3			71.0 ± 28.2			87.0 ± 23.7			78.0 ± 32.9		*
	Diet	10.0 ± 0.0			10.0 ± 0.0			9.7 ± 1.3			8.7 ± 3.5		
	Transfer	12.5 ± 3.5			12.5 ± 2.6			13.0 ± 4.1			12.3 ± 5.3		
	Grooming	3.5 ± 2.4			3.5 ± 2.4			4.7 ± 1.3			4.0 ± 2.1		
	Bowel movement	8.0 ± 3.5			8.0 ± 3.5			9.0 ± 2.8			8.7 ± 3.5		
	Bathing	2.0 ± 2.6			2.0 ± 2.6			3.7 ± 2.3			3.3 ± 2.4		
	Walking on a flat surface	10.5 ± 6.4			10.5 ± 7.2			14.0 ± 3.9			13.0 ± 5.3		
	Climbing stairs	4.0 ± 4.6			3.0 ± 4.2			7.3 ± 4.2			3.7 ± 3.5		**
	Dressing	7.5 ± 3.5			6.5 ± 3.4			8.3 ± 3.1			8.0 ± 3.7		
	Bowel movement	8.0 ± 3.5			7.0 ± 4.2			8.7 ± 3.0			8.3 ± 3.6		
	Urination	7.5 ± 3.5			8.0 ± 3.5			8.7 ± 3.0			8.3 ± 3.6		

Wilcoxon's signed-rank test
*p<.05 **p<.01

Table 4. Evaluation index for nursing care plan

			Intervention group (n=10)			Control group (n=15)			
	Items		Mean ± SD	n	%	Mean ± SD	n	%	p-value
Treatment and care[a]	Length of the hospital stay (day)		22.6 ± 8.8			33.5 ± 17.3			†
	Intravenous drip (day)		10.1 ± 5.3			11.1 ± 8.4			
	Number of days the catheter was retained in the bladder (day)		3.9 ± 7.1			12.8 ± 22.9			
	Number of days of body restraint (day)		2.0 ± 6.3			5.3 ± 16.7			
	Average bed rest percentage (%)		79.7 ± 7.2			77.7 ± 10.1			
Nutritional condition[a]	BMI (kg/m²)	At the time of hospitalization	23.2 ± 3.6		**[b]	20.6 ± 3.1		**[b]	
		At the time of discharge	21.4 ± 3.5			19.3 ± 2.7			
	Serum albumin levela	At the time of hospitalization	3.7 ± 0.5		**[b]	3.4 ± 0.5			
		At the time of discharge	3.4 ± 0.5			3.2 ± 0.5			
Background information[c]	Family caregiver	Yes		10	100		15	100	
		No		0	0		0	0	
	Living arrangement	Living with family		8	80		14	93	
		Living alone		2	20		1	7	
	Residence before hospitalization	Home		10	100		12	80	
		Facility[d]		0	0		3	20	
	Residence after discharge	Home		10	100		8	53	
		Facility		0	0		7	47	

[a] Mann-Whitney test
[b] Wilcoxon's signed-rank test
[c] Fisher's exact test
[d] Facility: Geriatric hospital, Health care facility for the elderly, and Acute care hospital
**p<.01
† .05<p<.1

were observed in total and in climbing stairs.

2) Evaluation of nursing care plan (Table 4)

Treatment and care, nutritional condition, and background information on life were investigated. In treatment and care, no differences were observed between the two groups in the length of

hospital stay, number of days the patient was on an intravenous drip, number of days the catheter was retained in the bladder, or number of days of body restraint, but all of these tended to be shorter in the intervention group. There were no differences between the two groups in nutritional condition with regard to BMI and serum albumin level. BMI and serum albumin level decreased in both groups after in comparison to before hospitalization; there were significant differences in BMI and serum albumin level in the intervention group and there was a significant difference in BMI in the control group. With regard to background information of the patients' lives, both groups showed the presence of family caregivers (100%). Two patients in the intervention group (20%) and 1 in the control group lived on their own, while the others lived with at least one family member. Ten patients in the intervention group (100%) and 12 in the control group (80%) came from their own home. With regard to residence after discharge, 10 patients (100%) in the intervention group returned to their own home, while 8 patients (53%) in the control group returned home.

3) Evaluation of exercise training (Table 5)

Two items, muscle thickness and femoral circumference, were investigated. Comparison of lower extremities functional capability between the two groups did not show any differences. Within-group comparisons showed decreased muscle thickness at the time of discharge compared to the time of hospitalization in both groups, and the difference in the intervention group was significant. In the intervention group, muscle thickness decreased from 2.2cm to 1.7cm (−22.7%), while that in the control group changed from 1.8cm to 1.6cm (−11.1%). Thus, the decrease in muscle thickness in the intervention group was approximately as double as that in the control group. Femoral circumference showed a significant decrease at the time of discharge compared to at the time of hospitalization in both groups.

Discussion

In this study we developed a program through interventions by interdisciplinary team to prevent disability in elderly patients with acute heart failure even after hospitalized treatments. The results suggested that this program is useful in maintenance of cognitive function and basic ADL. Here, we discuss this program in reference to the following two points.

1. Usefulness of the program

1) Usefulness of the team conference by interdisciplinary team

With regard to cognitive function, motivation, and basic ADL, the intervention group did not show a significant decrease at the time of discharge compared to the baseline, while in the control group, cognitive function and basic ADL were significantly decreased. That is, this program was useful in maintaining cognitive function and basic ADL before and after hospitalization. No effect of the intervention was observed in motivation only. In both groups, however, motivation at the time of hospitalization decreased to less than 7 points in both groups. A score of 7 points or less is considered as an indicator, suggesting extreme caution is needed in life prognosis. Therefore, we believe that continuous observation using objective indexes is necessary.

2) Usefulness of nursing care plan

All the subjects in the intervention group were able to return to their home after being discharged from the hospital. However, in the control group, 8 patients (53%) in the control group returned home

Table 5. Evaluation index for exercise training

		Intervention group (n=10)			Control group (n=15)		
		At the time of hospitalization	At the time of discharge		At the time of hospitalization	At the time of discharge	
Items		Mean ± SD	Mean ± SD	p-value	Mean ± SD	Mean ± SD	p-value
Lower limb function	Muscle thickness (cm)	2.2 ± 0.9	1.7 ± 0.7	*	1.8 ± 0.5	1.6 ± 0.6	
	Femoral circumference (cm)	39.3 ± 6.0	37.1 ± 5.8	*	37.3 ± 3.5	35.4 ± 3.6	*

Wilcoxon's signed-rank test
*p＜.05

and 4 patients (27%) were hospitalized or moved into facilities. In addition, the length of the hospital stay was approximately 10 days shorter in the intervention group. This may have been due to information exchange through periodical team conference by interdisciplinary team, which led to interactions with patients to confirm appropriate goals suited for individual conditions, and also because the nurses acted as a coordinator, which allowed for preparation for discharge from an earlier stage.

In addition, the number of days for which the catheter was retained in the bladder and number of days of body restraint tended to be reduced in the intervention group. As heart failure patients require bed rest and management of urine amount, a catheter is often retained in the bladder starting at the time of hospitalization. However, through this program, we believe that the mindset of nurses who are working to prevent immobility as well as deciding the necessity and the length of use has changed. In the intervention group, body restraint may not have been necessary because the cognitive function was better maintained.

3) Usefulness of exercise training

On the other hand, the muscle thickness, which is an indicator of lower extremity functional capability, decreased by approximately twofold in the intervention group compared to the control. Although there was no significant difference compared to the control group, this may have been due to the greater age as well as the severity in the intervention group compared to the controls as well as the significant decrease in serum albumin level in the intervention group at the time of discharge. The above observations indicate that older age makes it more likely for muscle thickness to decrease, as well as the effect of disuse muscle atrophy caused by reduced daily physical activity due to the condition of patients. In addition, there was a significant relationship between serum albumin level and the amount of muscle mass[22], and we therefore suspect an effect of nutritional condition during hospitalization.

It has been suggested that there is a relation between leg muscle mass measured by bioelectrical impedance analysis (BIA) and daily physical activity measured with an accelerometer[23], as well as leg muscle mass measured by dual-energy X-ray absorptiometry (DXA) and amount of daily walking[24]. Thus, to maintain lower extremity functional capability in elderly patients, caregivers must use an objective assessment to detect disability in an early stage and work to prevent and we must add nutritionists in the team and improve the nutritional condition of the patients. However, the relation was not checked for hospitalized elderly patients with acute heart failure and it indicates that we need to examine change of the muscle thickness and influencing factors. In regard to the measurement, the method has been confirmed that it was noninvasive and safe. While, though femoral circumference decreased significantly in the both group, relief of edema of the lower extremities seems to have effects and needs to be examined as the evaluation index.

2. Structure of the program and feasibility

As this program was effective to a degree in maintaining cognitive function as well as basic ADL, we believe it could be incorporated as a hospitalization program through intervention by interdisciplinary team. The feasibility of this program is good even in hospitals that have not obtained approval to function as a cardiac rehabilitation facility due to their medical environment and facilities.

In addition, as none of the 10 subjects in the intervention group quit or died during the study period, this program was safe and sustainable for elderly patients with acute heart failure. As nurses monitored the patients and managed their oxygen and intravenous drip use, patients with unstable respiratory condition and blood pressure, and cardiac dysrhythmia were able to participate in exercise training by their bed even in the acute phase when their condition can easily change. In addition, the program was performed while maintaining safety because of the information exchange between interdisciplinary team members with the physiotherapist.

3. Study limitations and future direction

The subjects for this program are limited to patients who are able to rise from bed and walk on their own, and the program is not suitable for patients who have low cognitive function and ADL. In addition, to practice the program, a cardiologist, an intensive care unit nurse, a cardiovascular ward chief nurse, cardiovascular ward nurses, a physiotherapist, a clinical laboratory technologist (cardiac rehabilitation educator) are needed in an interdisciplinary team, and the program is not suitable for hospitals that do not have them. As this study represents only the results from 1 facility, and due to the limited number of subjects, the generality of the findings presented here is limited.

In the future, it is necessary to increase the subjects and to select the content of this program carefully. In addition, further investigations are required to evaluate mid- to long-term effects, such as rate of rehospitalization after discharge as for disablitiy.

Conclusions

In this study we developed a program through intervention by interdisciplinary team to prevent disability of elderly patients with acute heart failure. The subjects were 25 elderly patients (10 in the intervention group, 15 in the control group). The subject hospital was an acute care hospital and had not obtained approval to function as a cardiac rehabilitation facility. We used disability, treatment and care, lower extremity functional capability as the evaluation index.

Our conclusions based on intervention results are as follows.

1. The intervention group did not show a significant decrease at the time of discharge compared to the baseline, while in the control group, cognitive function and basic ADL were significantly decreased
2. No differences were observed between the two groups in the length of hospital stay, intravenous drip, catheter in the bladder, body restraint, but all of these tended to be shorter in the intervention group. All the subjects in the intervention group were able to return to their home from the hospital. However, 8 patients (53%) in the control group returned home.
3. The decrease in muscle thickness in the intervention group was approximately double that in the control group. Femoral circumference showed a significant decrease in both groups.

Based on the above observations, we believe this program can be used as a hospitalization program with a team approach through interventions by interdisciplinary team. Also this program is feasible at hospitals which do not obtain approval to function as a cardiac rehabilitation facility. This program is a safe program from the early stage of hospitalization for elderly patients with acute heart failure, and helpful to prevent disability.

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急性心不全高齢患者に対する生活機能障害を予防する多職種介入によるプログラム

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要　　旨

【目的】本研究は、急性心不全高齢患者が入院前後の生活機能障害を予防するための多職種介入によるプログラムを開発し、その有用性を明らかにすることを目的とした。
【方法】多職種介入プログラムは「多職種チームによるカンファレンス」「看護ケア」「運動療法」の3つを骨子とした。対象者は、75歳以上の急性心不全患者であり、介入群（多職種介入によるプログラムを導入した群）10名、対照群（従来の入院加療を行った群）15名を分析対象とした。対象病院は、心臓リハビリテーション施設認定を取得していない急性期病院である。評価指標は、生活機能障害、治療・ケア、下肢機能である。
介入結果から以下の結果を得た。
【結果】
1．介入群はベースラインに比べ退院時に認知機能，意欲、基本的ADLに低下を認めなかったが、対照群は認知機能、基本的ADLが有意な低下を示した。
2．治療・ケアは、在院日数、点滴日数、膀胱留置カテーテル留置日数、身体抑制日数は、両群間に差はなかったが、介入群においていずれも短縮傾向であった。生活背景は、退院後の居住地において介入群では全員が自宅退院できたにもかかわらず、対照群は自宅退院が8名（53%）であった。
3．筋厚は、介入群は対照群に比べ約2倍減少した。大腿周囲径は、両群とも入院時に比べて退院時に有意に減少した。
【考察】本プログラムは、多職種のチームアプローチによる入院型プログラムとして採用できると考える。また、心臓リハビリテーション施設認定を取得していない病院においても実践可能なプログラムと考える。以上より、多職種介入によるプログラムは、急性心不全高齢患者に対し早期から安全なプログラムであり、生活機能障害の予防に有用であることが示唆された。