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Original Article

The improvements of rapid recovery nursing model on perioperative indicators after surgery and its effect on unhealthy emotion in the clinical nursing of patients with lung cancer

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Abstract: Objective: To explore the effect of rapid rehabilitation nursing mode on the improvement of perioperative index and adverse emotions in clinical nursing of patients with lung cancer. Methods: 86 patents with lung cancer admitted to our hospital were randomly split into two groups, the control group of common nursing model and the study group of rapid recovery nursing model, to compare their incidences of complications, and improvements in pulmonary functions, quality of life (QOL), and unhealthy emotions. Results: Compared with the control group, the study group had lower incidences of uroschesis, pulmonary infection, and venous thrombus complications ($P < 0.05$), shorter time for hospitalization, extubation, out-of-bed activities, passage of gas and use of antibiotics ($P < 0.05$), improved QOL ($P < 0.05$) and pulmonary functions ($P < 0.05$), and lower SDS, SAS and VAS scores ($P < 0.05$). Conclusion: Rapid recovery nursing is ideal for patients with lung cancer and of extremely high clinical value since it can not only improve the QOL, unhealthy emotion and reduce pains patients suffer, but also cut down the incidences of complications, enhance nursing safety, prognosis and pulmonary functions. Therefore, rapid recovery nursing model shall be further popularized and applied in the clinical nursing of patients with lung cancer.

Keywords: Lung cancer, rapid recovery nursing, value

Introduction

As a more common disease in clinic, lung cancer mostly attacks middle-aged and elderly groups, and its incidence rises on a yearly basis [1] with the increasingly aggravating aging trend in China. Reports have indicated that the incidence of lung cancer accounts for about 1/3 of global incidence of tumor as one of the malignant tumors [2] with the highest mortality and incidence worldwide. As social economy develops continuously, more industrial enterprises are incorporated, resulting in increasingly severe environmental pollution and high incidence of lung cancer consequently [3]. Significantly lung cancer impairs the physical health and reduces QOL of patients. Therefore, an exploration is necessary to find an effective therapeutic method for those patients [4].

With medical level being improved and developed continuously, more and more therapeutic methods are introduced, of which, surgery plays a major role with remarkable effects [5]. Nevertheless, factors such as heat consumption in belly, surgical wound and stimulation of anesthesia will affect the patients' pulmonary functions and recovery [6]. Therefore, timely nursing intervention shall be performed on patients. As a more common and comprehensive measure in clinic, rapid recovery nursing model plays a significant role by optimizing clinical treatment and diagnosis, maximally reducing patients' stress reaction to surgeries and incidences of complications [7]. Rapid Rehabilitation Nursing Model (FTS) is a multidisciplinary comprehensive intervention to reduce surgical stress and complications and promote the recovery of patients' body functions. Currently, this concept of

nursing has been widely used in surgery, but it has been read at home and abroad. The data found that most of the research directions focus on FTS on postoperative physiological recovery and prevention of complications.

This study explored the impact of the FTS concept on postoperative quality of life and negative emotions in patients with LC.

Materials and methods

General materials

86 patients with lung cancer admitted to Tongde Hospital of Zhejiang Province from February 2017 to February 2019 were selected according to following inclusion [8] and exclusion standards [9]. Patients who provided complete clinical materials and high compliance; never received radiotherapy before the study; were confirmed of lung cancer through clinical diagnosis; satisfied the diagnosis standards for lung cancer; understood the study-related contents and signed the informed consent were included. Patients having expressed their unwillingness to participate in the study or without complete clinical data; with mental disorder and cognitive dysfunction; with dysfunction of blood coagulation, liver and renal functions; with combined basic metabolic diseases; with surgical contraindications; in pregnancy or lactation, and with combined respiratory and circulation system diseases were excluded. Selected patients were randomly divided into two groups. This study has been approved by the Ethics Committee of Tongde hospital of Zhejiang province. All study participants provided written informed consent before participating in the study.

Methods

The control group adopted a common nursing model in which preoperative preparations included related drugs, etamine and surgical apparatuses; patients were communicated and informed of the treatment principle, clinical significance of partner treatment, and encouraged. After surgery, patients received analgesic treatment and were reminded of notes as well as the benefits of sufficient sleep and reasonable diets [10].

The study group adopted the rapid recovery nursing model in which patients received health education since clinical treatment will be compromised when they may be afraid, uptight and nervous due to lack of understanding on their state of illness. Therefore, paramedics shall explain the etiopathogenesis, treatment principle and possible complications of lung cancer, and inform patients the importance of reasonable diets, quitting smoking and alcohol, as well as proper exercises [11]. Next, paramedics shall communicate with patients actively to establish an amicable relation, and encourage them psychologically with successful cases, in order to improve their confidence and compliance in treatment. Patients' question shall be answered patiently to relieve them from any psychological stress [12]. Analgesia shall be performed during surgery with propofol at controlled injection rate and dose [13]; liquids shall be stored in incubator, and temperature in the operating room shall be properly adjusted to copy with body. Dietary intervention includes a little liquid on the day 1, semiliquid on days 2 and 3, and reduced fluid infusion after surgery. 6 h after surgery, patients shall be assisted for exercises by lifting their upper body properly and turning them over as their vital signs become stable, and 10 h after surgery, they shall practice coughing and breathing [14]. On day 1 after surgery, patients shall be required for proper exercises, including four limbs at horizontal positions, breathing and coughing [15] at an acceptable and tolerable intensity, to improve metabolic functions, immunity and resistance, and promote recovery greatly [16]. For instructions upon discharge, patients shall be informed of the notes and possible problems, and requirement for regular follow-up [17].

Observation indicators

The two groups were calculated and compared for incidences of complications, including urinary retention, pulmonary infection, anastomotic leakage, venous thrombosis and wound infection, etc. [18]. They were also compared for nursing effects, including time for hospitalization, extubation, out-of-bed activities, passage of gas and use of antibiotics. For comparison of QOL in both groups, SF-36 was applied to assess their QOLs before and after treatment, covering somatic, social, cognitive and role functions. Full score for all aspects is 100 [19]. Higher score indicates better QOL. Anxiety and depression assessment: Both gr-

Table 1. Comparison of basic data in both groups

Group	Gender		Age (year)	Tumor stage			Pathological typing		
	Male	Female		I	II	III	Adenocarcinoma	Squamous cell carcinoma	Other
Control Group (43)	27	16	51.4±2.5	14	24	5	17	24	2
Study Group (43)	25	18	52.3±2.7	13	23	7	15	26	2
x^2/t	0.195		1.604	0.054	0.047	0.387	0.199	0.191	-
P	0.87		0.93	0.82	> 0.05	0.65	0.78	0.84	1

oups were also compared for SDS, SAS and VAS scores before and after nursing. For SAS, with 50 as the boundary, scores above 70 correspond to severe anxiety, scores between 60 and 70 represent moderate anxiety and scores between 50 and 60 indicate mild anxiety. For SDS, with 50 as the boundary, scores above 70 correspond to severe depression, scores between 60 and 69 represent moderate depression and scores between 50 and 59 indicate mild depression. Pain assessment: Visual analogue scale, VAS, was used to assess the severity of pain patients suffered from, with 10 as the full score and representing unbearable pains, 7-9 representing excruciating pains, 4-6 representing severe pains, 1-3 representing mild pains and 0 representing no pains [20]. Lower SDS, SAS and VAS scores reflect more significant nursing effects. Both groups were compared for pulmonary functions according to indicators such as FEV1% before and after treatments and FVC. The Master Screen lung function meter measured the forced vital capacity (FVC) of the two groups of patients, the percentage of forced expiratory solvent in 1 second (FEV1% pred), and the forced expiratory volume in the first second as the ratio of vital capacity (FEV1/FVC). FVC reflects common indicators of airway obstruction, not only can display lung volume but also display 1 second flow, good repeatability; FEV1, FEV1/FVC increase indicates that lung ventilation dysfunction gradually relieves. Figures more approaching normal values indicate more significant nursing effects [21].

Statistical method

Data were analyzed with SPSS17.0. The count data was described by percentage (%), and the x^2 test was performed. The rank data was tested by rank sum test. The lung function, quality of life and anxiety/depression score were measured by the mean standard deviation (mean ± SD) description. If consistent with the normal distribution, data were analyzed with row t test; if does not conform to the normal distribution, the data were analyzed with non-parametric tests. $P < 0.05$ indicates significant differences.

Results

Comparison of basic data between the two groups

The study group (n=43) included 43 patients, 25 males and 18 females, age between 40 and 75, with average age of 52.3±2.7, of whom, 13 were in Phase I, 23 in Phase II and 7 in Phase III of tumor. In terms of pathological types, 15 were adenocarcinoma, 26 were squamous carcinoma and 2 were other diseases. The control group (n=43) included 43 patients, 25 males and 18 females, age between 35 and 72, with average age of 51.4±2.5, of whom, 14 were in Phase I, 24 in Phase II and 5 in Phase III of tumor. In terms of pathological types, 17 were adenocarcinoma, 24 were squamous carcinoma and 2 were other diseases. Patients have agreed with the study, and their materials were comparative ($P > 0.05$) as shown in **Table 1**.

Comparison of complications in both groups

The incidence of incision infection in the control group was 11.6%, slightly higher than 9.3% in the study group. There was no significant difference between the groups ($P > 0.05$). The incidence of urinary retention, pulmonary infection and venous thrombosis in the study group were 7.0%, 2.3% and 0 respectively, while in the control group it was 23.3%, 11.6% and 9.3%, respectively, and the difference between the groups was statistically significant ($P < 0.05$), see **Table 2**; **Figure 1**.

Table 2. Comparison of complications in both groups (cases, %)

Group	Number of Case	Uroschesis	Pulmonary infection	Anastomotic fistula	Venous thrombus	Infection of incisional wound
Control Group	43	10 (23.3)	5 (11.6)	0 (0)	4 (9.3)	5 (11.6)
Study Group	43	3 (7.0)	1 (2.3)	0 (0)	0 (0)	4 (9.3)
X^2	/	5.634	4.269	0	4.156	1.968
P	/	0.0021	0.0018	1	0.039	0.678

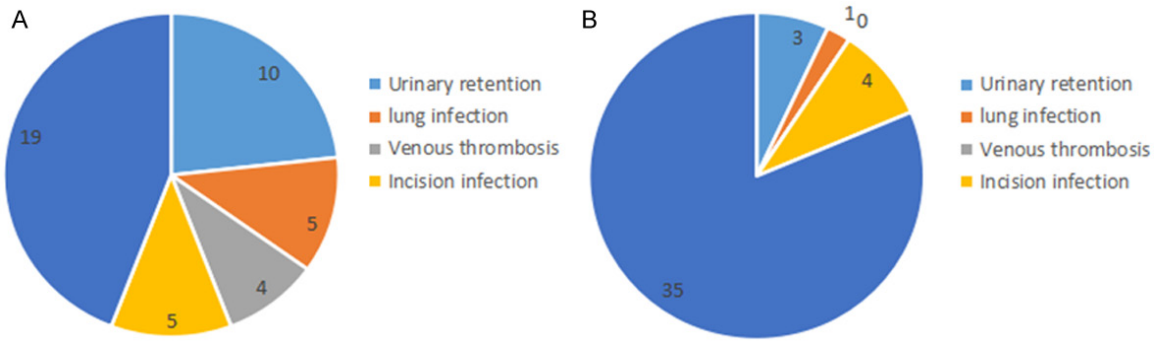

Figure 1. Comparison of the distribution of complications between the two groups. No obvious difference in the incidences of anastomotic fistula and infection of incisional wound was observed in both groups, but the study group had lower incidences of uroschesis, pulmonary infection, and venous thrombus than the control group.

Table 3. Comparison of nursing effects in both groups (cases, %)

Group	Number of Case	Time of Hospitalization (d)	Time of Extubation (d)	Time of Out-of-bed Activities (h)	Time of Passage of Gas (d)	Time of Using Antibiotics (d)
Control Group	43	9.9±2.8	4.7±0.5	41.2±5.1	4.4±0.7	6.6±0.9
Study Group	43	7.6±2.0	2.1±0.9	21.1±2.9	2.2±0.5	3.9±0.4
T	/	14.536	14.463	15.639	14.538	14.467
P	/	0.031	< 0.013	0.0011	0.012	< 0.0014

Comparison of perioperative indicators in both groups

The extubation time of the study group was 2.1±0.9 d, the time of getting out of bed was 21.1±2.9 h, the exhaust time was 2.2±0.5 d, the antibiotic use time was 3.9±0.4 d, and the hospitalization time was 7.6±2.0 d; the control group was 4.7±0.5 d, 41.2±5.1 h, 4.4±0.7 d, 6.6±0.9 d, and 9.9±2.8 d. The difference was statistically significant, as shown in **Table 3**.

Comparison of QOL in both groups

There was no significant difference in emotional function, social function, role function and cognitive function between the two groups before treatment (P > 0.05). After treatment, the scores of the four groups were significantly higher in the two groups. The scores of the dimensions of the study group were significantly higher than those in the control group (P < 0.05), as shown in **Table 4**.

Comparison of SDS, SAS and VAS scores in both groups

There were no significant differences in SDS, SAS and VAS scores between the pre-treatment groups (P > 0.05). The SDS score of the study group was 25.3±2.1, the SAS score was 24.5±2.4, and the VAS score was 2.2±0.7; the scores in control group were 37.6±2.7, 38.4±3.3, and 5.8±1.1. The difference between the groups was statistically significant (P < 0.05), as shown in **Table 5**.

Comparison of pulmonary functions in both groups

There was no significant difference in FEV1% pred, FVC and FEV1/FVC between the two gr-

Table 4. Comparison of QOL in both groups (score, $\bar{x} \pm s$)

Group	Number of Case	Emotional Function		Social Function		Role Function		Cognitive Function	
		Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing
Control Group	43	61.3±2.6	66.5±9.3	62.5±5.5	71.6±6.9	61.7±6.6	73.1±7.8	63.2±5.3	69.6±5.8
Study Group	43	62.4±2.8	87.3±11.2	62.7±5.4	86.5±7.8	61.6±6.7	84.8±8.2	63.6±5.4	83.8±7.3
T	/	1.456	15.863	1.469	14.643	1.455	14.426	1.539	15.463
P	/	0.845	0.003	0.852	0.043	0.945	0.042	0.854	0.032

Table 5. Comparison of SDS, SAS and VAS scores in both groups (score, $\bar{x} \pm s$)

Group	Number of Case	SDS Score		SAS Score		VAS Score	
		Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing
Control Group	43	62.3±3.6	37.6±2.7	58.6±3.5	38.4±3.3	7.5±2.2	5.8±1.1
Study Group	43	62.2±3.7	25.3±2.1	57.8±3.4	24.5±2.4	7.6±2.1	2.2±0.7
T	/	1.426	15.168	1.531	15.426	1.434	14.265
P	/	0.589	0.023	0.987	0.002	0.865	0.0012

Table 6. Comparison of pulmonary functions in both groups ($\bar{x} \pm s$)

Group	Number of Case	FEV1 (%)		FVC (L)		FEV1%/FVC (%)	
		Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing
Control Group	43	34.6±5.9	38.4±6.5	1.4±0.3	1.7±1.4	51.2±8.4	56.7±8.8
Study Group	43	34.7±6.1	42.5±6.3	1.5±0.3	2.8±0.3	51.3±8.5	68.2±8.7
T	/	1.563	15.426	1.486	14.638	1.526	15.638
P	/	0.756	0.003	0.643	0.0023	0.831	0.023

oups before treatment ($P > 0.05$). After treatment, the FEV1% pred of the study group was 42.5±6.3, FVC was 2.8±0.3 L, FEV1/FVC 68.2±8.7%, significantly higher than those in the control group: 8.4±6.5, 1.7±1.4 L and 56.7±8.8%. The differences were statistically significant ($P < 0.05$), as shown in **Table 6** and **Figure 2**.

Discussion

With the continuous development of medical level, rapid recovery nursing model has been widely applied in clinic and satisfies patients [22]. In an effective recovery model, sufficient preparations are made before surgery, and post-operative nursing is improved to reduce patients' stress reaction, promote the recovery of pulmonary functions and motor functions, enhance comfort and benefit recovery [23].

During rapid recovery nursing, health education helps enhance patients' cognition of their diseases, regulate unhealthy emotion to keep them active and positive, and improve treatment compliance [24]. Besides, interventions in diet and exercises of patients improve their immunity and motor functions. Results obtained through the study are consistent with previous studies and indicate that the study group required shorter time for hospitalization, extubation, out-of-bed activities, passage of gas and use of antibiotics ($P < 0.05$). It is also shown that rapid recovery nursing can effectively improve nursing effects and accelerate recovery.

During surgery, body temperature of patients will drop significantly due to the effects of anesthetics and exposure of wound [25], which not only results in higher incidences of complications but also higher stress reaction of body, compromising immunity. During rapid nursing recovery, liquids shall be stored in incubator and temperature in the operating room shall be regulated to further cut down the incidences

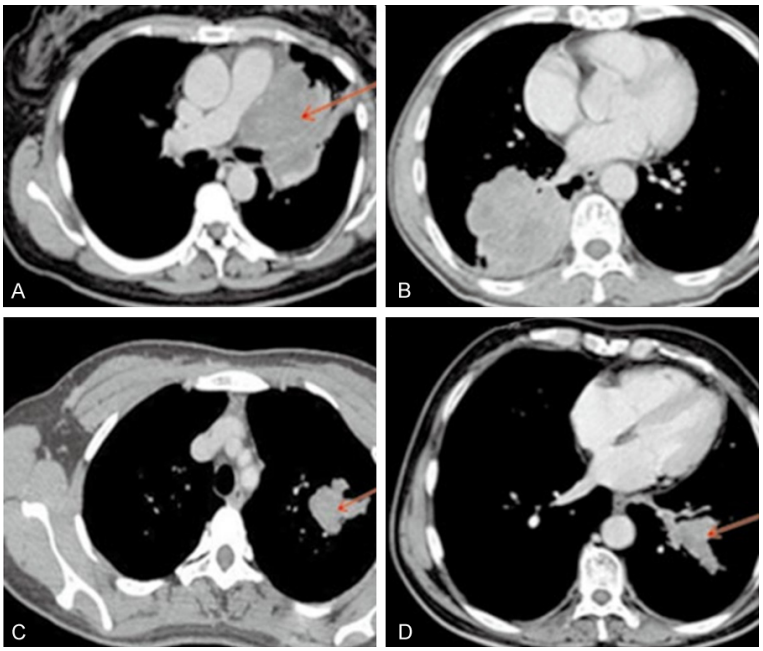

Figure 2. Pulmonary function of the two groups before and after treatment. A. Lumps at Hilum pulmonis, enveloping a bronchus and causing slight damage to bronchial wall, with less and light obstructive changes. B. Lumps in right lower lung (RLL), showed in mediastinal window and lung window with comparatively clear edges and without obvious obstructive inflammation and obstructive atelectasis. C. "Signs of multiple branches involved", with less and light obstructive changes, multilobar and segmental distribution of obstructive pneumonia and atelectasis. D. An eggplant-shaped or fusiform lump consistent with the long axis of bronchus.

of complications and improve nursing safety. Patients shall receive a chest examination for pertinent treatment based on their specific conditions as an alternative way to reduce incidences of complications. The study result that no obvious difference in the incidences of anastomotic fistula and infection of incisional wound was observed in both groups ($P > 0.05$), but the study group had lower incidences of uroschesis, pulmonary infection, and venous thrombus than the control group ($P < 0.05$), which findings fully support the role of rapid nursing recovery in reducing the incidences of complications including uroschesis, pulmonary infection, and venous thrombus, improving nursing safety and accelerating recovery. Paramedics shall communicate with patients actively and relieve them from any stress based on their psychological changes to improve unhealthy emotion. The finding that the study group had a better QOL ($P < 0.05$) and lower SDS, SAS and VAS scores than the control group ($P < 0.05$) after nursing shows the role of rapid nursing recovery in reducing anxiety, depression scores, severity of pains and improving the patients' psychological conditions.

This study verified the improvements of rapid recovery nursing model on perioperative indicators after surgery and its effect on unhealthy emotion in the clinical nursing of patients with lung cancer. Regardless of its better effect, more efforts are necessary since less understanding on the performance of patients in long term is obtained and deficiencies are observed in long-term follow-up, in order to improve deficiencies, provide patients with better services and improve nursing quality.

In conclusion, rapid recovery nursing is ideal for patients with lung cancer and of extremely high clinical value since it can improve the QOL, unhealthy emotion and reduce pains patients suffer, but also cut down the incidences of complications, enhance nursing safety, prognosis and pulmonary functions. Therefore, rapid recovery nursing model shall be further popularized and applied in the clinical nursing of patients with lung cancer.

Disclosure of conflict of interest

None.

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