

Original Article

Effect of continuous nursing on the quality of life and self-care ability of patients with ulceration over tophi

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Abstract: Objective: The purpose of this study was to explore the changes in quality of life (QOL) and self-care ability of patients with ulceration over tophi after continuous nursing. Method: A total of 78 patients with ulceration over tophi admitted to our hospital were randomized into the study group (SG, n=39, conventional nursing + continuous nursing) and the control group (CG, n=39, conventional nursing) by the random number table. The medication compliance, self-care ability [Exercise of Self-Care Agency (ESCA) scale], QOL (SF-36 scale), unhealthy emotions and uric acid level in blood before and after intervention were compared between the two groups. Results: Before intervention, the two groups showed no significant difference in scores of SF-36 scale, Self-Rating Anxiety scale (SAS), Self-Rating Depression scale (SDS) and uric acid level in blood ($P>0.05$); after intervention, the treatment compliance rate was 97.44% (38/39) in SG and 84.62% (33/39) in CG ($P<0.05$); the levels of self-perception, self-care skills, self-responsibility and health knowledge as well as the scores assigned to the dimensions in SF-36 scale in SG were significantly higher than those in CG ($P<0.05$); after intervention, SAS and SDS scores and uric acid level in blood in SG were markedly lower than those in CG ($P<0.05$). Conclusion: For patients with ulceration over tophi, continuous nursing is helpful in improving their medication compliance, self-care ability and QOL, and also contributes to a reduction in anxiety, depression and uric acid level in blood.

Keywords: Continuous nursing, ulceration over tophi, QOL, self-care ability, effect analysis

Introduction

Gout is a common chronic metabolic dysfunction disease and a complicated arthritis targeting all age groups, which is characterized by the typical clinical symptoms including arthralgia, edema, inflammation, etc. Generally, a painful sensation develops rapidly and then mitigates until it disappears. This process may last for several days or weeks. The earliest records of gout can be dated back to the 5th century. In recent years, with changes of people's life style and dietary structure, the incidence of gout has been on the rise year by year [1, 2]. According to an epidemiologic investigation, the incidence of gout is about 1-3% in China and 1-4% in developed countries in Europe and America. So far,

the specific causes of gout are unclear, but some studies have pointed out its correlation with obesity, excessive drinking, hypertension, hyperglycemia, intake of purine-rich food, drugs, and genetic factors [3, 4].

A tophus, also known as gouty node, occurs when urates of sodium glutamate accumulate under our skin. It can cause painful nodes covering the skin. Generally, tophi occurs easily in the tissues around joints, subcutaneous tissues and articular cartilages [5, 6]. Clinical practice has found that tophi develop 10 years after the first onset of acute urarthritis. If patients are not properly treated during the first onset, the incidence of tophi would be about 30% in 5 years, 50% in 10 years and 72% in 20

years [7, 8]. As some tophi appear at sites with thinner subcutaneous tissue, nodes are often ulcerated with white urate crystals. This process is named ulceration over tophi. It may induce fistula and increase the incidence of bacterial infection. Moreover, some gout patients have been taking steroid hormones for a long period of time, which further increases the difficulty of ulcer treatment [9, 10]. Continuous nursing, also known as extended care service and transitional care, refers to a series of coordinated and continuous nursing measures to ensure the health of patients when patients change or transition between different places or different levels of nursing in the same place. Continuous nursing, which originated at the University of Pennsylvania, has been clinically proven to significantly reduce the number of patients returning to the hospital and reduce the medical expenses of patients. China introduced the concept of continuous nursing in 2002. After years of practical research, the concept has been gradually popularized and applied in clinical practice. Many studies have pointed out that continuous nursing is of positive significance in improving the prognosis of patients with gout. This study aimed to analyze the feasibility of continuous nursing in patients with ulceration over tophi so as to provide reference for improving quality of life (QOL) and self-care ability.

Materials and methods

General materials

A total of 78 patients with ulceration over tophi admitted to our hospital from January 2019 to December 2019 were randomized into the study group (SG, n=39) and the control group (CG, n=39) by the random number table.

Inclusion criteria: (1) Those clinically diagnosed with ulceration over tophi; (2) those with clear consciousness to cooperate with the investigation; (3) those with complete medical records. This study was conducted with the approval from the Ethic Committee of the Hospital. Patients or their families signed and provided informed consent.

Exclusion criteria: (1) Complications such as mental disorders, severe dysfunctions of liver and kidneys, malignant tumors, severe underlying diseases such as coronary heart disease or cerebral infarction or other chronic diseases

that affected the investigation; (2) women in pregnancy or lactation.

Removal criteria: Patients who died, lost to follow-up or required withdrawal during the investigation were removed.

Methods

Patients in CG were provided with conventional tophi nursing, mainly including dressing, health education and diet reminding. No special intervention was arranged out of the hospital except for conventional return visits and inquiry.

Patients in SG were additionally provided with continuous nursing. The specific measures were as follows: (1) A continuous nursing team consisting of a doctor, a nutritionist and nurses was set up to collect clinical materials of patients and provide them with off-hospital nursing guidance. The team held meeting regularly to discuss patients' conditions and adjust the nursing scheme. (2) A health archive was built for each patient, including their basic information, style of work and daily life, dietary habits, health, medical history and medication information. The archive was updated from time to time after nursing. (3) Health education was adopted to sufficiently raise patients' awareness of the importance of nursing for ulceration over tophi. It was carried out through various channels, such as brochures, WeChat, telephone and video. The main purpose was to make patients understand the etiology, factors and prognosis of gout, etc., so that they could actively cooperate with the nursing and improve treatment compliance. (4) Dietary intervention. The nutritionist developed recipes for patients based on their dietary habits and physical conditions, and informed their family members. The doctor and nurses regularly followed up patients to understand the progress of dietary intervention, and adjusted the recipes according to the principle of less purine and more high quality protein. (5) Drug intervention. Taking drugs according to the doctor's advice was a necessary prerequisite for the improvement of clinical symptoms. In practice, some gout patients may withdraw from drugs without authorization as the gout symptoms worsen at the initial stage. Nurses were required to inform patients of the possible situation after medication, and instructed their family members to cooperate with medical staff in supervision. A regular medication system was

also established and implemented. (6) Psychological nursing. Because of the high incidence of unhealthy emotions, psychological evaluation of patients was required. This was a tool to understand their conditions. Through telephone or WeChat, patients were encouraged after leaving the hospital. The family members were required to communicate more with patients. In addition, patients with the same diseases gathered together to share experiences, build confidence and mitigate unhealthy emotions.

Observation indicators and evaluation criteria

Intergroup comparison of compliance after intervention

Compliance was evaluated in both groups by the Scale of Gout Treatment Compliance. The scale covers reasonable dietary, regular reexamination, reasonable medication at regular intervals and persistence in moderate exercise, and adopts the 4-point Likert scoring system. 4 points are scored if patients meet all requirements, 3 points if basically, 2 points if occasionally and 1 point if never. The sum of these items is the scale score and positively correlated to the medication compliance. Noncompliance is defined as a point under 6, partial compliance as a point between 6 and 12 and full compliance as a point between 13 and 16. Treatment compliance rate = (Full compliance + Partial compliance)/Total case number $\times 100\%$.

Intergroup comparison of self-care ability after intervention

The Exercise of Self-Care Agency (ESCA) scale was used to evaluate patients' self-care ability at 3 months after intervention. The scale includes self-care skills (12 items), self-responsibility (8 items), self-perception (9 items) and level of health knowledge (14 items). The scale score is obtained by adding up the score of each item. A higher score indicates better self-care ability.

Intergroup comparison of QOL before and after intervention

SF-36 was used to evaluate the QOL of both groups before and at 3 months after intervention. The scale is divided into 3 parts of 8 items, including physiological function, mental func-

tion and vital function. The scale is extensively applied in the clinic. A higher score indicates better QOL.

Intergroup comparison of unhealthy emotions before and after intervention

The Self-Rating Anxiety scale (SAS) and the Self-Rating Depression scale (SDS) were used to evaluate the anxiety and depression of both groups before and after intervention. Adopting a 4-point scoring system, the two scales contain 20 items respectively to reflect anxiety and depression, among which, questions to be positively/reversely scored are 15/5 in SAS and 10/10 in SDS. According to the normal criteria in China, patients are neither anxious nor depressed with SAS and SDS points below 49 and 52. Slight anxiety/depression is defined if the score ranges between 50 and 59 or 52 and 62; moderate anxiety/depression corresponds to 60-69 and 63-72; patients are identified as severely anxious/depressed when the score is at or over 70 or 73 [11, 12].

Intergroup comparison of uric acid level in blood before and after intervention

5 ml of fasting venous blood was drawn from all patients before and at 3 months after intervention. The blood was centrifuged at 3000 r/min. The serum was reserved and stored under -80°C for assay of uric acid level in blood using an automatic biochemistry analyzer. Intergroup and intragroup comparisons were performed before and after intervention [13].

Statistical analysis

Statistical analysis was performed with SPSS 22.0. In case of numerical data expressed as mean \pm standard deviation (mean \pm SD), comparison studies were carried out through Student's *t* test; in case of nominal data expressed as [n (%)], comparison studies were carried out through χ^2 test for intergroup comparison. For all statistical comparisons, significance was defined as $P < 0.05$.

Results

Intergroup comparison of general clinical indicators

There was no significant difference between the two groups in gender, age, weight, course

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Table 1. Intergroup comparison of general clinical materials ($\bar{x} \pm sd$)/[n (%)]

General clinical materials		SG (n=39)	CG (n=39)	t/X ²	P
Gender	Male	23	24	0.054	0.817
	Female	16	15		
Average age (y)		56.19±3.21	56.21±2.98	0.029	0.977
Average weight (kg)		62.18±3.22	62.22±3.31	0.054	0.957
Average BMI (kg/m ²)		22.39±2.19	22.41±2.21	0.04	0.968
Average course or disease (year)		3.29±0.41	3.31±0.39	0.221	0.826
Occupation	Farmer	9	9	0.311	0.811
	Worker	14	15		
	Others	16	15		
Educational background	Illiteracy	5	4	0.361	0.801
	Elementary school	11	12		
	Junior secondary school	14	13		
	Senior high school, college and university	9	10		
Marital status	Married	35	34	0.126	0.723
	Unmarried	4	5		
Joints involved	1	5	6	0.501	0.781
	2-3	15	14		
	4-5	16	15		
	>5	3	4		

Table 2. Intergroup comparison of compliance after intervention [n (%)]

Group	n	Full compliance	Partial compliance	Noncompliance	Compliance rate
SG	39	26 (66.67)	12 (30.77)	1 (2.56)	38 (97.44)
CG	39	15 (38.46)	18 (46.15)	6 (15.38)	33 (84.62)
t	-	-	-	-	3.924
P	-	-	-	-	0.048

of disease, marital status, educational background and family history ($P>0.05$) (**Table 1**).

Intergroup comparison of compliance after intervention

The rates of full compliance, partial compliance, noncompliance and treatment compliance were 66.67%, 30.77%, 2.56% and 97.44%, respectively in SG, and 38.46%, 46.15%, 15.38% and 84.62%, respectively in CG ($P<0.05$) (**Table 2**).

Intergroup comparison of self-care ability after intervention

At 3 months after intervention, patients in SG showed a higher ESCA score and higher levels of self-perception, self-care skills, self-respon-

sibility and health knowledge ($P<0.05$) (**Figure 1**).

Intergroup comparison of QOL before and after intervention

Before intervention, the two groups expressed no statistical difference in the scores of dimensions in SF-36 ($P>0.05$). After intervention, SG achieved a marked increase ($P<$

0.05) while the changes in CG were insignificant ($P>0.05$). The SF-36 score in SG was higher than that in CG after intervention ($P<0.05$) (**Figure 2**).

Intergroup comparison of unhealthy emotions before and after intervention

The two groups expressed no statistical difference in SAS and SDS scores before intervention ($P>0.05$) but experienced a sharp reduction after intervention ($P<0.05$). The SAS and SDS scores in SG were lower than those in CG ($P<0.05$) (**Figure 3**).

Intergroup comparison of uric acid level in blood before and after intervention

Before intervention, the uric acid level in blood was not significantly different between the two

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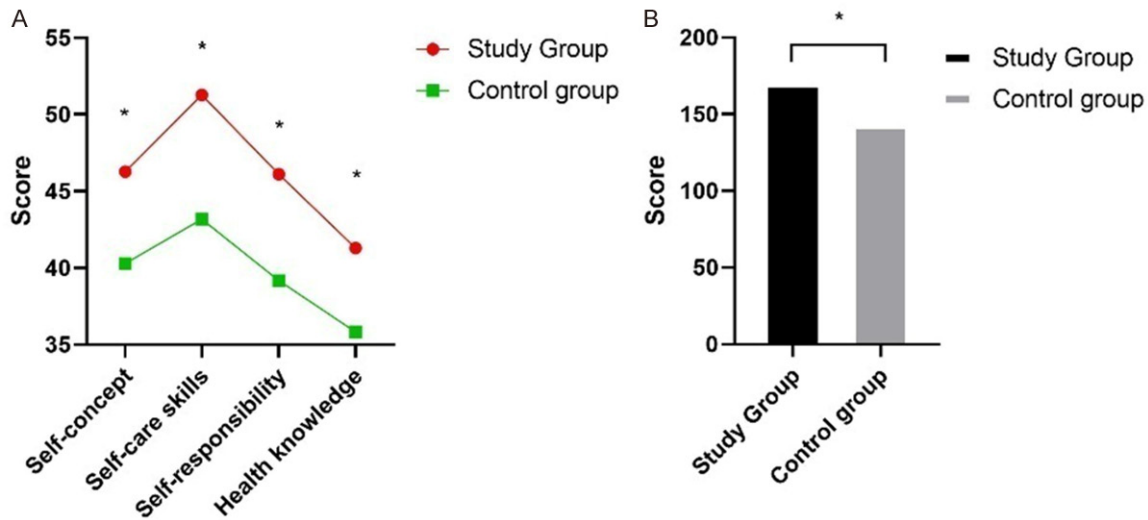


Figure 1. Intergroup comparison of self-care ability after intervention. At 3 months after intervention, patients in SG showed a higher ESCA score (B) and higher levels of self-perception, self-care skills, self-responsibility and health knowledge (A). * $P < 0.05$ vs CG.

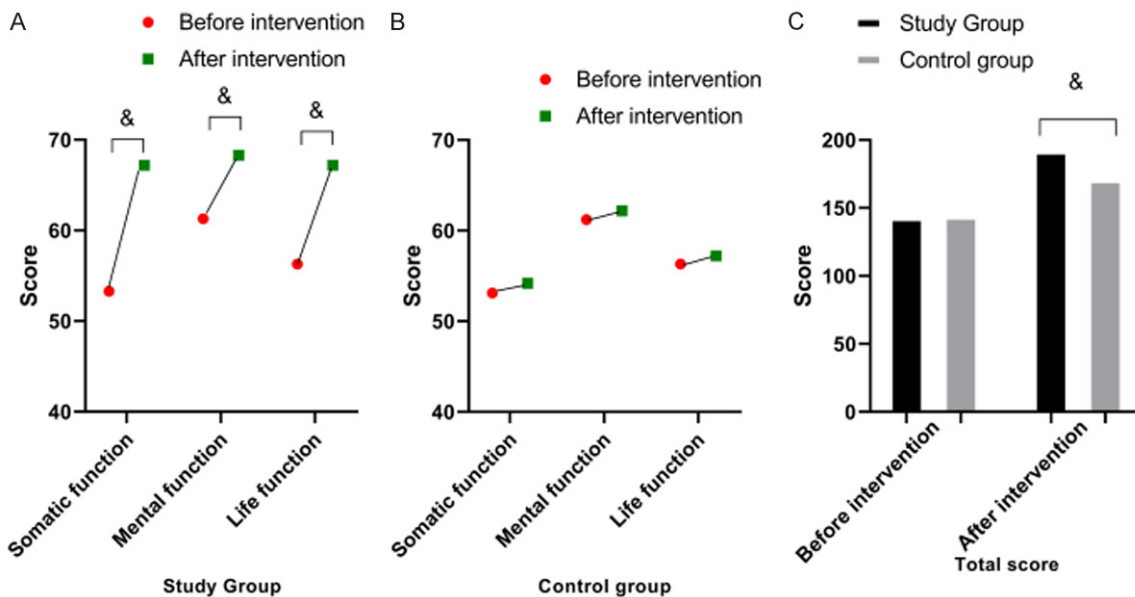


Figure 2. Intergroup comparison of QOL before and after intervention. At 3 months after intervention, SG achieved a marked increase ($P < 0.05$) (A) while the changes in CG were insignificant ($P > 0.05$) (B). The comparison of the total scores showed that SF-36 score in SG was higher than that in CG after intervention ($P < 0.05$) (C). & $P < 0.05$ vs CG ($P < 0.05$).

groups ($P > 0.05$). After intervention, the uric acid level in blood dramatically declined in both groups ($P < 0.05$), and the level in SG was lower than that in CG ($P < 0.05$) (Table 3).

Discussion

With the changes of people's life style and dietary structure, the incidences of various

metabolic diseases is increasing year by year [1, 2], including gout as a result of uric acid metabolism. Clinical studies have revealed that without systematic treatment, gout can be classified into the acute, intermission and chronic stages. It involves all organs in our body, especially the kidneys where uric acid deposits and destroys renal functions. As a result, uric acid excretion is affected and the symptoms of gout

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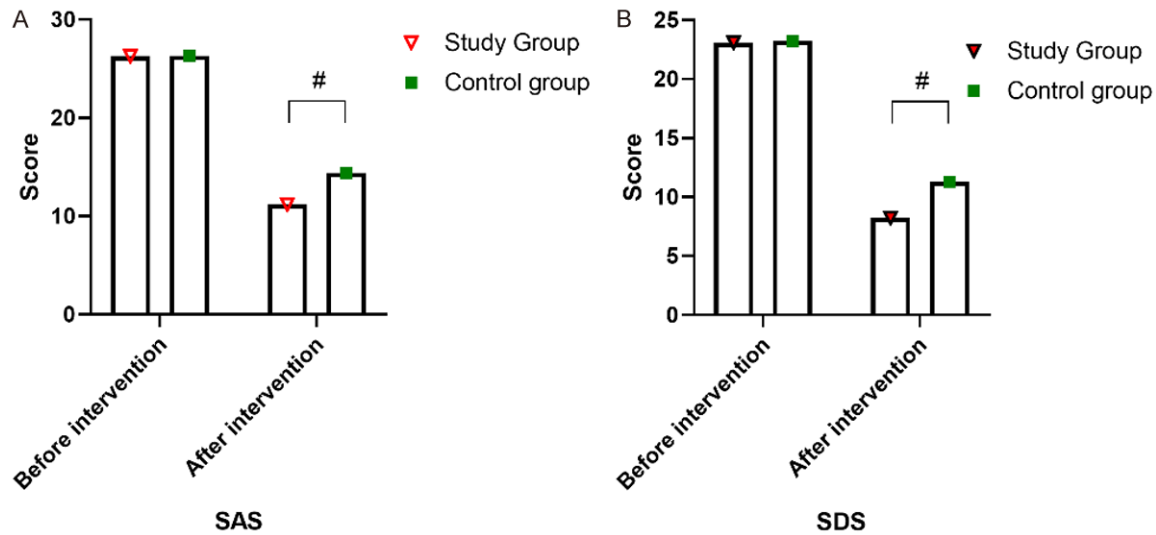


Figure 3. Intergroup comparison of unhealthy emotions before and after intervention. The two groups expressed no statistical difference in SAS and SDS scores before intervention ($P>0.05$) (A). The SAS and SDS scores in SG were lower than those in CG ($P<0.05$) (B) after intervention. # $P<0.05$ vs CG.

Table 3. Intergroup comparison of uric acid level in blood before and after intervention ($\bar{x} \pm sd$)/($\mu\text{mol/L}$)

Group	n	Before intervention	After intervention
SG	39	439.19±21.92	370.19±20.19
CG	39	441.28±20.39	389.28±21.29
t	-	0.436	4.063
P	-	0.664	<0.001

worsen [14, 15]. Tophus is a characteristic lesion of gout. It develops in patients with gout, but does not receive timely and reasonable treatment in the early stage of the disease. In these patients, the uric acid in blood keeps on rising and urate deposits in tissues and organs, finally leading to joints stiffness, limited motion and other symptoms. Over time, tophaceous tubercles expand and turn to ulceration over tophi in case of thin extra-todular skin [3, 16].

In most cases, ulceration over tophi will severely hurt patients physically and mentally. On the one hand, tophi are large in volume and adhere closely to the surrounding tissues. During dressing, clearance with vessel forceps and rinsing with saline water are necessary, causing severe pains. On the other hand, uric acid crystals are excreted from the ulcers, leading to fistulous tracts and infection. Finally, pains related to ulceration over tophi become aggravated and patients are obviously anxious and

depressed. These factors will affect the treatment to a certain degree. According to the clinical practice, the nursing of ulceration over tophi is a long and slow process. In addition to the necessary wound cleaning and dressing in hospital, patients have to take medicines regularly and control their diets, which challenge their self-care ability [17]. An investigation of 128 patients with ulceration over tophi showed that 30.45% of the patients withdrew drugs without approval due to drug-related adverse reactions, 21.88% missed taking medication without being reminded or supervised, and 60.94% could not get necessary dietary guidance [18]. Besides, a number of investigations on the treatment compliance and influencing factors of gout patients showed that almost 20% of them did not know that uric acid in blood was the cause of gout, while only half of them used colchicine. Further investigations of demands presented that 90% of the patients urgently required off-hospital nursing guidance which was believed to be an effective means of alleviating clinical symptoms [19].

This study analyzed the effects of continuous nursing on improving the QOL and self-care ability of patients with ulceration over tophi. The results showed that the treatment compliance rate was 97.44% in SG and 84.62% in CG, which established the role of continuous nursing in improving the treatment compliance of

patients with ulceration over tophi. Some studies have pointed out that affected by finance, lifestyle, family factors, etc., patients with gout have always been poor in compliance with treatment. A survey of 81 patients showed that only 28.40% of the patients had good drug compliance, 49.38% had good dietary compliance, and 24.69% had good compliance of both aspects [20]. Some scholars have found that continuous nursing can incorporate the treatment compliance of patients into the treatment system. Patients' degree of attention to treatment was fully improved by early health education. Meanwhile, family members were used to supervise patient's implementation of diet control and regular medication. Both measures ensured the efficiency of plan implementation and improved the treatment compliance of patients. The blood uric acid level of the patients in the SG after intervention was lower than that in the CG, indicating that the changes in compliance had practical clinical reflections. Further investigations also found that continuous nursing could significantly improve patients' self-care ability. The authors of this paper believe that there are two reasons for poor self-care ability of patients with ulceration over tophi: (1) Shortage in necessary self-care knowledge; (2) Subjective factors [14]. Continuous nursing improves patients' level of health knowledge and nursing skills to enhance their self-care ability and then alleviate the clinical symptoms. After intervention, the QOL of SG was significantly improved, indicating that patients' physical, psychological and vital functions could be improved by enhancing self-care ability. This study also analyzed the effects of continuous nursing on the unhealthy emotions of patients with ulceration over tophi. This shall be attributed to the fact that continuous nursing fully takes into account the possibility of anxiety and depression that patients may have due to the impact of the disease. Health educations, family supports, encouragements from other patients and other measures have effectively improved patients' confidence for the treatment of the disease. In addition, regular psychological assessment was performed to understand the psychological status of patients for timely intervention and effectively reduce the incidence of unhealthy emotions.

In conclusion, continuous nursing can significantly raise patients' medication compliance

and self-care ability, improve QOL, and reduce anxiety, depression and the uric acid level in blood, which is worthy of clinical promotion. However, this study is defective for the following reasons: (1) Limited samples brought about insufficiently representative results; (2) Laboratory indicators were not sufficiently and dynamically analyzed; (3) Long-term follow-up was not arranged. Therefore, future studies shall involve more samples and observation indicators as well as a longer follow-up period, so as to provide more detailed data supports for the nursing of patients with ulceration over tophi.

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Disclosure of conflict of interest

None.

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