

Application of Remote Management in Home Peritoneal Dialysis Patients

LAI rongfang, WANG chunhua, GUAN baozhang, ZHONG yingxue, YIN lianghong, LIANG weiting, CHEN yu *

Department of Nephrology, the first affiliated hospital of Jinan University, Guangzhou 510630, China

Corresponding Author: CHEN yu *

Abstract: Objective: To explore the application effect of remote management in patients with peritoneal dialysis at home. **Methods:** 118 patients who were accepting peritoneal dialysis treatment at home between January 2019 and December 2019 were equally divided into two groups. The control group was followed up by telephone and regular clinic according to the original plan. The experimental group was implemented remote information management, including advance appointment clinic, online APP prescriptions, peritoneal dialysis APP, replying the inspection result in WeChat group, online guidance on announcements and psychological care. **Results:** There was no significant difference between the experimental group and the control group on the incidence of complications of peritoneal dialysis. However, the level of follow-up rate and satisfaction of the experimental group was significantly higher than the control group ($p < 0.05$). **Conclusion:** Remote management can provide great convenience for patients of home peritoneal dialysis by timely follow-up, saving traffic time between home and hospital. It can also reduce the risk of cross-infection and improve patient satisfaction, which has a significance to be popularized in clinic.

Keywords: Remote management; Home; Peritoneal dialysis; Application

Peritoneal dialysis, as one of the main methods for the treatment of chronic renal failure(CRF), has the advantages of no dialyzer and can be performed at home for a long time, also known as home peritoneal dialysis.^[1]

Thanks for the national policy and its own advantages, more and more CRF patients choose peritoneal dialysis. But due to lack of awareness of the disease, heavy psychological burden and poor self management, most of the patients suffer from complications. Medical personnel need to carry out continuous follow-up management for such patients.^[2] Telephone and WeChat are universally applicable, and WeChat is a new social media with the advantages of simple operation, rich functions and direct access to information. By combining WeChat with the Peritoneal dialysis APP which was launched in our hospital in 2019, information remote management is carried out, so that patients can communicate with medical personnel without leaving home.^[3]

1 MATERIALS AND METHODS

1.1 General information

From January 2019 to December 2019, 118 patients (60 males and 58 females) with abdominal dialysis nurses in our hospital were selected as home-based peritoneal dialysis patients, with an average age of 48.5 years. There were 59 cases in each group. The control group received telephone follow-up and regular outpatient visits according to the original plan. The experimental group was implemented remote information management.

1.2 Methods

1. 2. 1 Establish the remote management process of home peritoneal dialysis patients.

(1) Phone and WeChat follow-up: According to patients' age, culture level, the usage of electronic products, to choose the right means of communication, and lists the main contents of follow-up : the current way to drain, fluid volume, blood pressure and weight, appetite, sleep, defecate, wound care and complications, diet and sanitary control. Good hand hygiene, proper wearing of masks, regular UV disinfection room.

(2) Follow-up of peritoneal dialysis APP: Patients were introduced to the APP and the difference between the APP and manual peritoneal dialysis diary. Patients were encouraged to download the APP on their mobile phones and register the data related to daily peritoneal dialysis, so as to replace the manuscript of peritoneal dialysis diary. Medical staffs learn the doctor's guide manual, enter through the website, check the patient groups, return visit records and recent data changes, provide guidance, and conduct corresponding health education.

(3) Outpatient follow-up: Open a fast track. In principle, home patients with stable condition, except for laboratory examination when due, can be represented by family members with good resistance to the hospital to achieve peritoneal dialysis fluid, abdominal penetration supplies and oral medicine. Patients and their families should make an appointment before prescribing, make a medicine list in advance and contact with nurses by phone or WeChat to do a pre-evaluation about their general situation. Nurses should measure vital signs once the patients get to the

According to the situation, doctors can give medical advice as soon as possible, so that patients reduce the risk of infection by reduce their time in hospital, .

1. 2. 2 Strengthen the knowledge and skills training of follow-up nurses

Organize the follow-up nurses to learn the instruction manual of abdominal dialysis APP: registration, login, patient management, grouping, follow-up, personalized health education information push, questionnaire survey, etc. Strengthen professional study, to identify and preliminary deal with the complications of peritoneal dialysis, including liquid balance and diet, understanding the commonly used drugs, the FAQ and solutions of peritoneal dialysis, the PD related infections complications: peritoneal dialysis related peritonitis, tunnel infection, exit infection complications and noninfectious complication: catheter dysfunction, increased intra-abdominal pressure caused by the hernia, leakage, peritoneal function failure, etc.

1. 2. 3 During the telephone, WeChat and APP follow-up, patients were comprehensively evaluated in terms of their specialties. According to the existing problems of patients, nurses provide home peritoneal dialysis patients with specific, personalized guidance and knowledge education.

(1) During the remote follow-up, nurses should make a comprehensive assessment of the patients and provided adequate guidance, mainly including:

1) Peritoneal dialysis related item: the way to drain, fluid volume and time, blood pressure and weight change, pipeline protection and care at the exit, appetite, sleep, defecate frequency, exercise, etc., to guide the patients to summarize the blood pressure, body weight, urine volume, ultrafiltration volume, water volume, etc., and record in book or APP. Under normal circumstances, the fluid volume is 500 ml plus urine volume the day before to drain plus abdominal clear dewatering volume the day before.^[4]The nurse logged into the APP to understand the dialysis status of those patients, communicated with the doctor and gave feedback to the patient. If there is a gradual weight gain, edema or increased blood pressure, nurses should tell the patients to limit their intake of water and sodium, and report to the abdominal doctor. The prescription and drugs should be to adjust according to the doctor's guidance.

2) Peritoneal dialysis catheter exports: use protection bag when bathing, avoid to get wet and polluted, disinfection every two days. If the temperature is high in summer and perspire easily, disinfected once a day. The wound should be treated with dressings or sterilized gauze protection. The exposed part of the short tube should be extended to the tunnel along the abdomen through the dressing. If there is redness, swelling, secretions, patients should use medicine, disinfect daily after the external

application of ointment according to the doctor's advice. And then track daily results, back to the hospital to receive treatment when necessary.

3) Keep bowels open: If constipation appears, guide the patient to increase the intake of vegetables, fruit, adhere to exercise. If problem still can not be solved or diarrhea appears, patients should consult with the doctor through the APP online, use medicine under the guidance of doctors.

4) Home, personal and dietary hygiene: Tell the patient to clean room and the operating table every day, use ultraviolet to disinfect room at least once a day, 30 minutes each time. In case of rain and humid weather, increase disinfection. Change the liquid, change the dressing operation: once a week to cut nails, prepare the supplies, put on the mask after washing the hands, do not touch the surrounding items or answer the phone, directly start the operation. After the operation, wash hands or use the non-washing liquid. Food hygiene: eat fresh, cooked food, eat seasonal fruit, do not eat overnight food, roadside food, etc.

5) WeChat answer: create WeChat group for home peritoneal dialysis. WeChat group members include doctors, nurses, patients, families. Set a time each day to answer questions, correct the misperception of patients or their families in time, make its right to self monitoring and management, improve the compliance.

(2) Contact patients by telephone or WeChat to inform them of the evaluation, examination, test results, peritoneal dialysis prescription and drug program adjustment, understand the feedback after the adjustment, and minimize the frequency of patients or their families to and from the hospital.

(3) Knowledge education: 1) the correct use of masks: identify positive and negative side of the mask, folding away, nose and mouth to package sealed. In case of cold, cough and sneeze, change mask frequently. When not worn, fold the negative side in and put it into a clean bag. Masks can't be reused inside out because the dust and bacteria can easily accumulate at the positive side of the mask. (2) hand hygiene: using seven steps washing method, wash hands in flowing water. The following three points are important. One, clean the fingernail tip, finger crack and finger joint. Two, clean the finger that wears ring. Three, flush the faucet with water. After washing the hand to wipe dry, pad with clean wipe toilet paper to close faucet, door handle.^[5]Touch the elevator or handrail after shielding with tissue paper. Try not to touch public facilities in the community, carry disinfection supplies with you, and wash hands in time and carefully after going out and going home;^[6]Insist on exercise, enhance the constitution, can choose to walk, taijiquan, ba duan jin and other light physical exercise.

1.3 Evaluation methods

(1) The number of outpatient follow-up visits between the experimental group and the control group from

January to December 2019 was compared. (2) Complication rate and satisfaction of the experimental group and the control group was compared.

2 THE RESULTS

From January 2019 to December 2019, abdominal dialysis nurses in our hospital provided remote follow-up for 59 patients with home-based peritoneal dialysis, which greatly reduced the opportunity for PD patients to go out for medical treatment, reduced the risk of personnel gathering and cross-infection, reduced the medical expenses of patients' families, and also reduced the burden and pressure of medical institutions' sense of control. In addition, the remote communication between doctors, nurses and patients can bring the convenience which face to face communication can not received. CRF patients need to for a long time in the adjustment to drain and the medicine under the guidance of doctors prescription, remote communication can improve the efficiency, easy to get data at any time, improve patient satisfaction. It is beneficial to patients and their relatives response

timely on the advice of the doctors and nurses treatment. This regular follow-up act as a bridge between doctors, nurses and patients.^[7]At present, the patient's condition and psychological status are stable and the outcome is good.

Statistical analysis

SPSS13.0 was used for statistical analysis of the collected data, t test was used for comparison of measurement data, and X^2 test was used for comparison of enumeration data. $P < 0.05$ was considered statistically significant.

Results

1.1 Postoperative complications in the two groups

After X^2 test, the complications in the observation group were significantly lower than those in the control group, and the difference was statistically significant ($P=0.04$).

Table 1 comparison of complications between the two groups (n)

group	The number of cases	peritonitis	Dialysis pipe outlet	Acute heart failure	Population complication	Outpatient follow-up
Control group	59	4 (59)	1 (59)	6 (59)	11 (59)	21 (59)
Experimental group	59	3 (59)	2 (59)	2 (59)	7 (59)	11 (59)
χ^2		0.152	0.34	2.10	1.05	4.29
P		0.70	0.56	0.14	0.31	0.04

Satisfaction survey: Table 2. The satisfaction of remote management of 59 PD patients was investigated by questionnaire star, and the satisfaction was 98.31%, higher than that of the control group (Very satisfied: 80 ~ 100 points; Satisfied: 60 ~ 79 points; Dissatisfied: < 60 points).

Table peritoneal dialysis patient satisfaction survey (n)

group	The number of cases, n	Very satisfied	Satisfied	Dissatisfied	Satisfaction (%)
The experimental group	59	37	19	2	98.31
The control group	59	35	17	7	88.13

3 DISCUSS

Increasing prevalence of chronic kidney disease in our country, is one of the important public health problem all over the world. At present, the main treatment of chronic renal failure end-stage are peritoneal dialysis and hemodialysis. Peritoneal dialysis has the advantages of not being affected by quarantine or traffic jams. But the regular follow-up is still necessary, mainly through regular daily outpatient follow-up, supplemented by telephone follow-up. Understanding the patient's physical and mental conditions and effect of drain helps the doctors to adjust treatment.^[8]Considering the patients' low immunity and high risk of all kinds of infection, they are the population with high incidence of all kinds of infection. Complications will bring new burden to patients, families, society and hospitals, which is

worthy of common attention. Home peritoneal dialysis last long and various problems in the process of dialysis can be solved. It has great significance to improve the quality of home peritoneal dialysis, prevent complications and enhance the ability of self management and confidence for treatment. Therefore, using telephone, WeChat and APP to manage peritoneal dialysis patients remotely is worth promoting.^[9-10]

4 CONCLUSION

By providing the experimental group patients with remote management service such as online prescription and online follow-up on telephone, Wechat and APP, the problem of long queue time in hospital has been solved and patients can avoids the continual round trip between home and hospital, reduce the risk of cross infection. There was no significant difference between the experimental group

and the control group on peritoneal dialysis complications, but the number of outpatient follow-up of the experimental group is significant reduced ($P = 0.04$). as the decline in outpatient follow-up difference was statistically significant. The patient satisfaction of the experimental group was also increased by 10.18 compared with the control group.

REFERENCES

- [1] Guo L L, Hu Y, Fei J P, et al. The level and influencing factors of self-care agency in patients undergoing peritoneal dialysis [J]. Chinese Journal of Nursing, 2013, 48 (5) : 436-438.
- [2] Liu X C, Yang F G, Wang W H, et al. Application of the Motivational Interviewing on the Self-management among Patients with Continuous Ambulatory Peritoneal Dialysis [J]. Nursing Journal of Chinese People's Liberation Army, 2016, 33 (16) : 1-7.
- [3] Huang C H. Observation on Effect of WeChat Platform Follow-up on Self Management of Patients with Peritoneal Dialysis at Home [J]. Clinical Medicine & Engineering, 2008, 25 (11) : 1545-1546.
- [4] You L M, Wu Y. Medicine nursing [M]. Beijing: People's Medical Publishing House, 2014:428.
- [5] Li M W. Washing hands and wearing masks in the prevention of SARS [J]. International Medicine & Health Guidance News, 2003 (24) : 78.
- [6] Liu L X, Chen M X, Li Y L, Huang Y P. Home protection and dietary guidance for cancer patients during novel coronavirus pneumonia virus epidemic [J/OL]. Journal of Modern Oncology: 1-3 [2020-02-23].
<http://kns.cnki.net/kcms/detail/61.1415.R.20200214.1053.002.html>.
- [7] Chen L H, Liu Y P, Xing W J. Construction of Doctor-Patient Remote Management System Based on Mobile Internet [J]. China Medical Devices, 202, 35 (01) : 89-91+110.
- [8] Kang Y Y. Prevalence of adult chronic kidney disease in China: a meta-analysis [D]. Zhengzhou University, 2017.
- [9] Yan R Y. Effects of continuous nursing on nursing satisfaction and complications of patients with continuous ambulatory peritoneal dialysis [J]. Today Nurse, 202, 27 (02) : 56-57.
- [10] Arnaud Lefevre, Philippe Soyer, Kouroche Vahedi, Youcef Guerrache, Sylvia Bellucci, Valerie Gault, Mourad Boudiaf. Multiple intra-abdominal venous in ulcerative colitis: Role of MDCT for detection [J]. Clinical Imaging, 2010, 35(1).