The status quo and prospect of transfer and shift in patients receiving hemodialysis in China[†]

Review

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Abstract: Hemodialysis is the main alternative therapy for patients with end-stage renal disease; most of the hemodialysis centers in China are not designed together with the inpatient ward. During the hospitalization period, hemodialysis patients often move back and forth between wards and hemodialysis rooms because of the treatment needed. Hemodialysis patients are a special group of hospitalized patients, most of them are elderly patients. The overall basic diseases of the patients vary very much, and the cause of the disease is complex. Moreover, the chronic inflammation progresses slowly, and immune function declines. Some of the patient are seriously ill or even have organ failure. All these factors affect the patients in general. Therefore, the transfer safety of patients during hospitalization is facing great challenges. The researchers reviewed the status of transshipment research in Chinese hemodialysis patients and laid the foundation for the research and development of related handover tools and perfect handover mode in the future.

Keywords: elderly patient • hemodialysis • transshipment • handover • dialysis patients • dialysis safety • patient handover • review

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1. Introduction of related concepts

Chronic kidney disease (CKD) is a major disease that endangers human health worldwide. According to the United States Renal Data System (USRDS) 2014

report, the prevalence of CKD in the United States was 13.6%.¹ The prevalence rate of adult CKD in China in 2012 was 10.8%. The incidence of end-stage renal disease (ESRD) is increasing year by year.^{2,3} Patients with ESRD in China increase by 12,000–15,000 per year, and now they have reached about 1,500,000. About 90% of them choose hemodialysis therapy.^{4,5} By the end of 2015, the registered hemodialysis patients in China had reached about 385,055 cases.⁶

With the maturity and progress of blood purification technology, hemodialysis has become the significant alternative therapy for ESRD; the frequency of dialysis

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is about two to five times a week. Chinese researcher Zhang⁷ reviewed 99 patients with long-term maintenance hemodialysis. Her study showed that the hospitalization rate of hemodialysis patients was 59.6% within 2 years.⁷ Song's⁸ study on readmission factors in maintenance hemodialysis patients showed that the readmission rate of 6 months was 50.6%, which was three times higher than the average hospital readmission rate. The top three reasons for readmission were cardiovascular complications (33.3%), infection (26.2%), and digestive tract symptoms (19%).⁸ Due to the need for treatment, hemodialysis patients often move back and forth between the ward and the hemodialysis room.⁹ Hemodialysis patients are a special group of hospitalized patients, most of them are elderly patients. The overall underlying diseases of the patients vary very much, and the cause of the disease is complex. Moreover, the chronic inflammation progresses slowly, the immune function is also declines, and a certain proportion of the patients is affected. Some of the patient are seriously ill or even have organ failure.¹⁰⁻¹² Therefore, the safety of transportation during hospitalization has been faced with great challenges.

2. Risk of safety in hemodialysis patients

According to the data released by the Pennsylvania Patient Safety Authority, 2,390 cases of transport-related safety incidents were reported; about 41% of which were caused by poor communication. Therefore, higher requirements for communication ability and efficient handover ability of shift nurses are required. If nurses do not have strong sense of responsibility, negligence of the patient's condition, and missing important information to hand over and take over, the nurses in the ward and hemodialysis room will not be able to communicate effectively in time. This will become a hidden danger of nursing safety for the patients with hemodialysis. Hemodialysis room has high requirements for nurses' professional quality, and nurses are relatively fixed, but nurses do not necessarily know about patients' condition in wards. Moreover, nurses in wards need to know patients' condition during dialysis so as to better observe the trend of disease change and formulate the reasonable nursing measures. It is considered that improper communication between nurses and other medical care personnel or failure to effectively communicate are two reasons that can lead to severe contact interruption for patients, untimely affect treatment, and form potential harm to the patient's medical and nursing services, and the potential damage to the patients^{13,14} and can interfere with effective information transmission and

reception in heavy nursing work. However, the safety of transport and handover in hemodialysis patients in China is less concerned.

3. Chinese research hotspots of transshipment transfer in patients with hemodialysis

3.1. Analysis of unsafe factors in the process of transfer

Hemodialysis patients are mostly elderly people; unsafe factors come from various aspects, and mostly, they are affected by their own underlying diseases, such as hypertension, the risk of falling, or falling to bed after taking antihypertensive drugs.¹⁵⁻¹⁷ The effects of hemodialysis complications, such as dialysis imbalance syndrome, electrolyte disorder, renal osteopathy, renal anemia, and other high risk factors, are affected by environmental factors, such as unfamiliarity with the hospital environment. There are many hidden dangers and uncontrollable factors in the process of transfer.

3.2. The prevention and countermeasures of the unsafe factors in the process of transport handover

- (1) The aspect of personnel training—We should strengthen the training of nurses' professional ethics and safety awareness and enhance the training and training of new recruited nurses. We should emphasize the importance of patient safety, avoid unsafe factors in transportation process, and deal with emergencies flexibly.
- (2) The aspect of rules and regulations—We should make the reasonable transfer system, especially verification system and shift system. We should monitor the continuous optimization and improvement of the transfer process and model in the nursing work to ensure the patient information, verification, transshipment, and then transfer to check the efficiency of the implementation of the rules and regulations.
- (3) The aspect of the transfer process management—Meticulous management of handover process, completion of handover records, attention should be paid to the accuracy of language description during handover. We should control the delivery time to ensure the efficiency of the nurses.
- (4) The aspect of quality control—We should set up the quality control group of hemodialysis

handover and standardize the handover class verification, so as to ensure that the patient's handover content is not wrong and the patient's handover process is orderly.^{18–20}

3.3. The status quo of the design and use of China transshipment handover

In various countermeasures, the use of transshipment handover is proved to be able to effectively improve the efficiency of communication between nurses, to standardize and complete the nurses in the delivery of hemodialysis patients, to avoid missing important information, to reduce the number of nurses to return to the ward and hemodialysis room, and to reconfirm the number of letters by telephone, thus saving the transfer time. The time was given to the nurse and the nurse was returned to the patient. The process of filling out the order is a process that nurses reevaluate and think about the patient's vital signs, the current condition, the condition of the blood vessel, the situation of drug use, the change of the special condition, etc. The correct evaluation is beneficial to the patient's correct nursing operation and follow-up treatment, thus greatly improving the quality of transshipment delivery of the patient to the patient.^{21–26}

According to the needs of practical work, some researchers designed relevant records for patients with hemodialysis from different perspectives and purposes such as the transshipment handover designed by Wang et al.²⁷ It has simple advantages that are clear to understand, do not need long time to fill in, and can save time for nurses' handover work. Entries include "patient information, urine volume and blood pressure, ward shift, dialysis special requirements, actual permeability, and dialysis condition." The use of the transfer sheet canceled the requirement that the patient's medical record must be carried out. The transfer process should be regulated, the incidence of adverse events in transport and transfer should be reduced, and the safety and quality of transport should be ensured. Wang et al.²⁸ through the analysis of the safety problems existing between the hemodialysis room and the sick areas in the last few years of the undergraduate room designed a succinct, easy-to-fill handover record and promoted the quality improvement of the weak link during the handover process. The dialysis record list of researcher is grouped into two parts. The first part is before hemodialysis, which includes "patient information, spirit, life signs, ECG monitoring, oxygen inhalation, pipeline, skin, infusion, micropump, other drugs, hemodialysis access, internal fistula, catheterization, the skin of the puncture point, and the drug that is brought into the patient's room for the blood specimen

examination." The second part is after hemodialysis, and the transfer contents include "vital signs, electrocardiogram, monitoring, oxygen inhalation, medical pipeline, skin, infusion, micropump, other drugs, hemodialysis access, internal fistula, jugular catheterization, femoral vein catheterization, permanent catheterization, down machine time, and special matters." Doctor and nurse handover class, nursing quality record, and table doctor record are designed by Mo et al.,²⁹ and the content includes "The total number of dialysis, the new hemodialysis patients, the special perfusion, the long-term catheterization, the regular perfusion, the Hemodiafiltration (HDF), the special shift, the key patients, and the responsible nurses."²⁹ The merits of the transfer sheet are clear for the patients in the ward and the individual's nursing status, so that the doctors and nurses can master the treatment and nursing situation of the patients. Zeng and Liang³⁰ designed the transfer of shift contents, including "patient basic information, transfer time, escort mode, skin compression site, pipeline situation, brain observation, special drugs, speed, and attention, according to the specific situation of patients, such as diabetic patients need to test blood glucose 2H after the meal, and finally nurse signature." The design advantage of this table is comprehensive assessment, with brain observation section, simple form record, and improved collaboration between departments. Guo³¹ designed inpatient hemodialysis transfer handover, which has the advantage of evaluating the volume and bleeding risk of patients. Zhang et al.³² designed the patient's handover of the ward and blood purification center as follows: predialysis patient information, vital signs, preoperative medication, and preoperative preparation: skin condition, double vena cava catheter, internal arteriovenous fistula, and various drainage tubes. The infusion fluid that is carried with the patient will also be recorded: out time and in time. Postdialysis information such as "treatment, the patient's vital signs, consciousness state, and postoperative conditions: skin, internal arteriovenous fistula, double vena cava catheter, drainage tube, with the patient with infusion fluid, with data, dialysis medication, and dialysis time to ward time." The transfer sheet pays more attention to preoperative and postoperative conditions and nursing and internal fistula development and improves nurses' attention to internal fistula, so as to promote the maturation of internal fistula. It is suitable for patients undergoing hemodialysis after internal fistula operation and early patients with internal fistula.

4. Revelations and prospects

After extensive literature review, we review and think about transportation and handover in maintenance of

hemodialysis patients in China. It is found that the followings need to be improved: (1) The design content of the partial transshipment handover record is too single; it does not refine the special condition of the specialist; and it pays little attention to the evaluation of the transport of hemodialysis patients. (2) Part of the handover requires a nurse to write more words, bring a burden to the nursing work, make the nurses fill in the process to create a conflict of emotion, and in a short time, it is not enough to complete the effective delivery and reception of the patient's information. (3) Some scientific and appropriate clinical research methods were used in the construction process, so the objectivity and reliability of the research results need to be further verified. The design of transport handover for hemodialysis patients is mostly based on the status quo of the department. It is still too subjective to be popularized.

At present, international and domestic requirements for the safety of nursing handover have also been put forward. Joint Commission on Accreditation of Health Care Organizations standards (JCI standards) is an international standard for evaluating the quality and management of medical institutions. The JCI standard, as the "gold standard" for the quality evaluation of the global medical industry, has been strict with the medical quality and medical safety requirements. The standard clearly points out "enhancing effective communication."³³⁻³⁸ Timely, accurate, complete, clear, and easy-to-understand effective communication can reduce nursing errors and improve the patient safety and nursing quality. Because of the particularity and specialty of hemodialysis treatment, nurses have great risks in nursing and transferring patients, and the safety of patients' handover is an important part of the quality of nursing safety. When the connection is not clear or omitted, it often leads to the occurrence of bad nursing events. The extent of recognition is reduced or even medical disputes occur, which leads to tension between nurses and patients. Furthermore, nursing work is the teamwork, and the nursing errors may cause unnecessary contradictions among the nurses, which is not conducive to the construction of the team and the development of the nursing work in the future.

The 10 safety goals of the 2017 edition of the patients in China clearly point out that the medical staff should strengthen effective communication and gradually improve the system of medical system transfer, so that the key information of the patients can be accurate, timely communicated, and transmitted. We should establish standardized information communication process and strengthen handover system,

including nursing shift system, patient referral, and transshipment aspects. We should encourage medical staff to adopt efficient communication or communication channels, so as to ensure the accuracy, accessibility, and convenience of communication.³⁹

Paying attention to nurses' transfer in hospital for hemodialysis patients can effectively avoid nurses' negligence of the patient's condition, omission of important transfer information, prompt and effective communication between nurses in ward and hemodialysis room, and increase the content of nurses' assessment of the patient's condition of hemodialysis. We should enhance the safety awareness of nurses' transportation and transfer and improve the safety and effectiveness of transport and handover for hemodialysis patients. Thus we effectively reduce the incidence of adverse events and ensure the safety of medical service and the safety of nursing quality, so as to improve nurse patient's satisfaction with shift.

Future research directions can draw lessons from the research results of effective communication tools and advanced communication methods in foreign medical industry. In view of the deficiency and nonstandard situation in the delivery of hemodialysis patients in China, a scientific clinical scientific research method and clinical preliminary experiment were adopted to construct the transfer mode of hemodialysis patients in accordance with the national conditions of our country and standardize the transfer of nursing staff. The efficiency and accuracy should be considered in clinical application, so as to protect the continuity of the work and provide reference for nurses to effectively hand over hemodialysis patients. Therefore, the effective communication between the ward and the nursing staff in the hemodialysis room will be promoted, and the nurses' transfer efficiency and the receiving rate of effective information for the patients with hemodialysis are improved, and the patient's current condition is timely and accurate. At the same time, it should also improve the communication ability and critical thinking ability of nurses, so as to reduce the occurrence of adverse events caused by improper communication, improve the patient's satisfaction with quality of handover class, and reduce medical disputes.

Ethics approval

Not declared.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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