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Application of graded management of high-alert medications in clinical nursing.

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Abstract

Objective: To explore the application value of graded management system in clinical nursing through implementing graded management of use of high-alert medications.

Methods: 170 patients, who were taking high-risk drugs in our hospital, were selected as the research objects. The graded management was implemented for the high-alert medications in our hospital, i.e. rectification, arrangement, sweeping, quality and safety management, to enhance the medical staff's knowledge of high-alert medications and achieve standardized storage and preservation of dangerous medications. The nursing satisfaction and the high-alert medication inspection conditions were compared before and after graded management.

Results: Patient's satisfaction on the nursing after graded management was significantly improved compared with that before graded management ($P<0.05$). The problems of grading of high-alter items, labelling of high-alert medications and handover registration of high-alter items were significantly decreased ($X^2=7.943$, $P<0.05$). Compared with the condition before management, the following frequencies were lowered after management: expired drugs ($X^2=3.735$, $P=0.047$), basic drug errors ($X^2=4.889$, $P=0.03$), unclear and incomplete identifications ($X^2=5.213$, $P=0.029$), wrong placement times ($X^2=5.837$, $P=0.025$) and non-standard storage ($X^2=4.016$, $P=0.041$).

Conclusion: It is necessary to establish a sound high-alert medication management system such as graded management, to enhance the satisfaction of patient's care and ultimately to reduce the medication errors, improve the patient's medical safety. It is worthy of promotion in clinical practices.

Keywords: High-alert medication, Graded management, Clinical nursing, Application study.

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Introduction

High-alert medication management should pay more emphasis on the harm to patients due to improper use of medications. More attentions should be paid to the use of medications in the medical institutions. In the daily nursing work, there is management deficiency for the incomplete cognition of high-alert medications, which brings risks. Relevant reports have shown that the nurse's lack of knowledge and skills for the use of medications is directly associated with the occurrence of adverse events. The management of high-alert medications is a new concept and new difficulty of the clinical nursing work. Traditionally, the definition of management of special medications mainly focuses on management according to laws and reasonable uses. However, the high-alert medication has no fixed, standardized dose, and it safety index of use is narrow. Unreasonable medication may seriously threaten the lives of patients [1]. Relevant study report data showed that, more than half of life-threatening factors are directly associated with the rapid rate of drug infusion. At present, the clinically commonly-used high-alert medication graded management system is more standardized and strict for the use of high-alert medications. Nursing staffs should not only master the professional knowledge and skills, accumulate rich experiences, but also strengthen the learning of the knowledge and method for the use of high-alert medications, to enhance their cognition level of high-alert medications and prevent the occurrence of adverse events in advance [2]. Therefore, in this study, we explored the application value of graded management system in clinical nursing through implementing graded management of use of high-alert medications, to provide reasonable improvement measurements for clinical treatment.

Data and Methods

General data

170 patients were randomly selected to use the high-alert medications of the hospital during the period from July to February 2016. There were a total of 15 clinical departments in our tertiary hospital, and there were 410 first-line nursing staffs. Before implementation of graded management, our Nursing Department had inspected the quality management of the high-alert medications used in all departments, recorded the various adverse events for the use of high-alert medications within the two months before graded management, mainly including unclear labelling of medications, non-standardized placement, incorrect base of medications, non-standardized storage and preservation and expiry of medications, etc. In addition, the above events were also recorded in details after graded management.

Graded management method

After strict rectification, the necessary items were placed in the appropriate position according to the demands and requirements, labelled clearly and placed neatly. An eye-catching warning label should be affixed to the position where the high-alert medication was placed wrongly, to arouse the attentions of pharmacists when dispensing. When changing the position, it was necessary to inform relevant staff of the Preparations Department as quickly as possible, then the high-alert medications were stored in the eye-catching red drug cabinets independently, and the racks of drug cabinets were painted different colors according to the category of high-alert medications, for example, yellow for high-alert medications of high concentrations of electrolyte preparations, green for muscle relaxation high-alert medications, blue for cytotoxic high-alert medications [3]. Unified classification was performed in all departments in the hospital; medications were placed in the racks by the licensed trained staffs, to ensure that the medications were consistent with the labels in the racks. When arranging high-alert medications, each injection in the Pharmacy Department should be affixed with the fragile cards with warning effect to warn the relevant staffs, to avoid incorrect placement. The fragile cards could guarantee to be damaged by nurses to give a warning; sweeping was to avoid the occurrence of events of misuse or mixed use. Sweeping tools such as red barrels were equipped for the high-alert medications alone, and placed on the operating table, and placed in the barrels when sweeping high-alert medications. The quality of high-alert medications were improved and through carrying out the related management training of high-alert medications, nurses should be able to achieve the conscious use, arrangement and sweeping from weak consciousness and warning, especially for nursing staffs of department with high frequency of use of high-alert medication, including Anesthesia Department and Oncology, etc. The principle of double-person dispensing of high-alert medications should be strictly implemented to ensure correct dispensing; the safety training management is to mark them with red pen in the configuration list of the high-alert medications to achieve the effect of eye-catching. When dispensing high-alert medications, two persons should supervise each other, and during the operation, one person read the name and dose of medication and the other person dispensed the medication. During the use, the flow rate should be controlled, to observe the medication conditions and adverse reactions of patients, and the related medications for rescue should be prepared in advance [4-6]. The Nursing Department should make the rounds of the wards regularly, to check the period of validity and storage conditions.

Develop the graded management of high-alert medications: The Administration Safety Program Group of Committee of Hospital Pharmacy, Chinese Pharmaceutical Association issued the Graded Management Measures and Recommended Directory of High-alert Drugs. The management of high-alert drugs is one of important medical and caring safety. In recent years, it has been highly concerned.

The high-alert medication management category should be established according to the actual situation of the hospital in accordance with the national category, and the related graded management system should be established. According to the risk degree, high-alert medications were divided into three grades: A, B and C. The names, dosage forms and specifications of each kind of medication should be detailed. The grade A high-alert medications were mainly used with the highest frequency and if mediation error occurred, patients would face the highest risks of death, and the medications mainly included intravenous adrenergic receptor agonists, intravenous adrenergic receptor antagonist, hypertonic glucose injections, etc. The grade B high-alert medications were mainly used with the moderate frequency and if mediation error occurred, patients would face serious injuries, such as antithrombotic drugs, epidural or intrathecal injection, radioactive venous contrast agent, etc. The grade C high-alert medications were used very frequently and if mediation error occurred, patients would face injuries, such as oral hypoglycaemic drugs, oral opioid analgesic drugs, etc. The training of nursing staff mainly includes the following contents: the concept and category of high-alert medications, grading of high-alert medications, potential risks and related rescue measures, usage and dosage, correct route of administration, the monitoring, collection and storage standardization during medication, and precautions for medication for nursing staffs, etc.

Evaluation indexes

The high-alert medication conditions were recorded and checked, and the satisfaction degree of patients on the high-alert medications was investigated.

Results

Survey of hospital workers

The survey results were shown in Table 1.

Effect of graded management

The problems of high-alert medications occurring after graded management were significantly reduced compared with those before graded management, P<0.05. Results were shown in Table 2.

Satisfaction

The results of satisfaction before and after graded management were shown in Table 3. Compared with that before graded management, the satisfaction after graded management was enhance by about 23.1%, with statistically significant difference (P<0.05).

Table 1. *Survey of general conditions of clinical nurses.*

Item	Number of staffs	Composition ratio (%)
Sex		
Male	110	26.83
Female	300	73.17
Age		
<30	67	16.34
30-40	185	45.12
>40	158	38.54
Academic background		
Undergraduate and above	198	48.29
Undergraduate and below	212	51.71
Title	249	60.73
Below nurse level	161	39.27
Above nurse level	110	26.83

Table 2. *Comparison of graded management effect.*

Category	Expired drugs	Incorrect base of drugs	Unclear and incomplete marks	Placement error	Non-standardized storage
Before management	2	18	21	16	9
After management	0	3	4	0	0
X^2	3.735	4.889	5.213	5.837	4.016
P	0.047	0.03	0.029	0.025	0.041

Table 3. *Results of satisfaction (n).*

Category	n	Satisfactory	Ordinary	Unsatisfactory	Degree of satisfaction (%)
After management	170	95	70	5	97.1
Before management	170	73	54	43	74
X^2					7.943
P					0.005

Discussion

According to the definition of American Medical Safety Association, the medications that may cause serious injury or death to the patient due to improper use are called high-alert medications. These medications can play obvious clinical pharmacological effects and quick efficacy, and if used improperly, they can cause harms to human body, mainly including high-concentration electrolyte preparations, muscle relaxants and cytotoxic drugs, etc. These drugs can easily cause effect on patients due to high error rate in the hospital, and they are the major factors for the events [7]. This kind of medicine causes obvious damage, with high probability of occurrence. Compared with the general drugs, once errors of high-alert medication occur, the consequences will be more serious, which may cause adverse consequences for the patient's recovery. The use of medicines is a kind of events that easily produce direct nursing risks in the clinical nursing. Although the relevant personnel has raised the safety warning for the use of high-alert medications for many years, medical staffs cannot effectively avoid the errors of use of high-alert medications, which can bring harms to patients with high occurrence rate in clinical practices [8]. Therefore, the effective improvement of medication safety, especially including the safety of high-alert medications, is still worthy of attentions by nursing staffs.

Clinical nursing has a high risk for the direct implementation of high-alert medications. Besides, clinical nurses are lack of clinical practice experience, and they have different awareness of the high-alert medications; therefore, it is required to know the relevant knowledge of high-alert medication, cognitive attitude and ability to deal with events. In addition, to enhance the management of high-alert medications, it is necessary to enhance the relevant nursing quality of patients, as a one of the key links [9]. In order to ensure the smooth implementation of

the treatment work, it is required to reasonably regulate high-risk items. To win the treatment time, it is required to guarantee the correct use, orderly management and preparation of medications in clinical works, which is also an important guarantee for the pre-hospital rescuing the patient's life. In addition, it is required to implement more standardized management, to improve the nursing.

The results of this study showed that, compared with that before graded management, patients' satisfaction on nursing was significantly improved after graded management ($P<0.05$), and the problems in standardization of high-risk items were significantly reduced ($P<0.05$). Along with the arrival of informatized technology, our hospital has many aspects to be improved because our computer informatization construction is relatively backward and should subsequently construct and gradually improve the functions of the high-alert drug computer-aided medical order system and the clinical decision-making support system.

In summary, the clinical treatment work is largely dependent on the standardized management of medicines. Therefore, standardized management work should be strengthened. It is required to guarantee individuals and enhance their enthusiasm and initiative to jointly participate in the management work.

References

1. Ji L, Fan YY, Hu W. Influencing factors of nursing staffs' knowledge level of high-alert medications. Chin Nurs Management 2015; 15: 1107-1110.
2. Lan BE, Mou P. Exploration on high-alert medication management mode of hospitals. Chin Licensed Pharm 2013; 12: 41-43.
3. Long SQ, Chen HY. The clinical significance and value of graded management of high-alert medications on the nursing work. Chin Med Eng 2014; 22: 194-198.
4. Wu XL. Thinking on safety used of high-alert medications by nurses. Chin J Clin Rational Drug Use 2012; 5: 116-118.
5. Zhang JW, Zhang RH. The practices and experiences of graded management of high-alert medications in No.155 Hospital. Pract J Med Pharm 2014; 31: 822-826.
6. Zhang T, Ma LP. Exploration on graded management of high-alert medications. Chin Licensed Pharm 2013; 12: 41-47.
7. Zhou Y, Liu QF. Application of graded management of high-alert medications in clinical nursing work. Chin Clin Nurs 2015; 7: 520-523.
8. Xiao YL, Liu H, Wu SL. The application and effect of quality control circle in improving the nurses' cognition of high-alert medication. J Nurs Administr 2014; 14: 129-130.
9. Zhan XN. Study on graded management model of high-alert medications. Chin Health Care Nutrit 2014; 24: 1313.

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