Original Article

Reviewing the effect of nursing interventions on delirious patients admitted to intensive care unit of neurosurgery ward in Al-Zahra Hospital, Isfahan University of Medical Sciences

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Abstract

BACKGROUND: Disease is an abnormal process that affects all aspects of the human life. The hospital environment and particularly the intensive care unit (ICU) causes stress in the patient and hi/her family. Delirium, due to its sudden onset and startle, unconsciousness, memory impairment, illusion and dynamic or sedentary behaviors, is known as one of the stressor agents. Despite its high prevalence and the high cost complications such as long term mechanical ventilation, hospital pneumonia, pressure ulcer, prolongation of hospitalization in the hospital or the intensive care units, performance reduction and increase in mortality, this disorder remains unknown in most cases. In line with the other treatment team members, nurses should also participate in controlling the discountable factors, helping patients to cope with uncontrollable factors and using pharmacological methods to manage the delirium and feature their own unique capacity more through quick recognition, reviewing the causes and providing scientific care in improving the quality of patient care and improving the patients' health status. Hence, this study aimed to review the effect of nursing interventions on delirium of the patients admitted to ICU of the neurosurgery ward in Al-Zahra hospital in Isfahan.

METHODS: A two-group multi-stage clinical trial study was carried out on 40 patients with hyperactive delirium admitted to ICU. The questionnaire included demographic data, Richmond Agitation Sedation Scale to assess the irritability rate and study method and also cognitive confusion in intensive care unit to determine delirium status of the study population. Simple sampling method was conducted and the study samples were randomly divided into two intervention and control groups. The following nursing interventions performed on the intervention group: assuring, emotional support, clear information and effective communication with the patients and their families and also allowing family visits twice a day. In the control group, the sample received the normal and routine ICU cares. The irritability and delirium severity status of the samples were analyzed on the day of admission and the fifth day using descriptive and inferential statistical methods and also SPSS software.

RESULTS: Statistical analysis showed that although there was no significant difference between the groups on the first day of admission in terms of the irritability and delirium severity status, this was significant on the fifth day of the study. Wilcoxon test in the intervention and control groups indicated a significant difference between the study subjects in terms of the irritability and delirium severity status on the first day of admission and the fifth day which indicated the reduction in the irritability severity. But, this reduction was higher in the intervention group than in the control group. Furthermore, McNemar test showed that the number of the subjects with delirium in both groups reduced on the fifth day compared to the first day of admission and there was a significant difference between these two days, the number of samples without delirium in the intervention group was almost two times higher than that in the control group on the fifth day.

CONCLUSIONS: Nursing interventions are considered as one of the non-pharmacological methods in treating delirium and by using these methods appropriately in ICUs, the patients' hypoactive delirium can be reduced.

KEY WORDS: Intensive care units, delirium, nursing interventions.

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Patient is a part of the community which is treated at the time of disease at a health care organization called hospital.[1] Florence Nightingale believed that main duty of the hospitals includes not harming the patients and patient care and providing health care services to the clients should be one of its main objectives.[2] Meanwhile, patient is in a complex critical situation that is influenced by direct interaction with a complex environment. The patients admitted to the ICU due to psychological crisis in which one or more systems threaten the patient's life would undergo the treatment and care by the most skilled and professional staff with the best condition and the most equipped facilities and equipments.[3,4] But Garland believed despite its vital and critical feature, this unit is considered as a problematic part of the healthcare system[5] so that the patient and his family based on their previous experiences would consider admission to this unit as a sign of imminent death.[6] One of the disturbing, prevalent but unknown factors in intensive care units is the delirium. Delirium is the general deficit of the cognitive processes which is characterized by sudden onset, unconsciousness, memory impairment and illusion.[7] Hyperactive delirium, hypoactive delirium and mixed delirium are identified as the three subgroups which someone may experience any of them during the day.[8] The other symptoms of delirium are difficulty in establishing social interactions, restlessness, aggression, sleep cycle disorder, alertness and drowsiness.[9]

The prevalence of delirium in the internal intensive care units in Cohort studies in terms of disease intensity and tools were 20%, 70% or 80%.[10] Increasing this phenomenon is associated with the increase in mortality, prolonging the hospitalization in ICU or hospital, increase in the time of sedatives and mechanical ventilation, need for additional intubation and ultimately increase in ICU and hospital costs.[11,12] So that ICU and hospital costs were estimated as $22.346 and $41.836, respectively, for patients with delirium in comparison with $13.332 and $27.106, respectively, for the patients without

delirium.[11] However, delirium would be remained unknown in 66 to 84 percent of the patients admitted to ICUs, public wards and emergency wards.[13]

On the other hand, identified risk factors for this syndrome are multiple including severity of illness, history of dementia and cognitive deficit, increasing age, the electrolyte imbalance, hypotension, increasing the blood sugar, azotemia, fever or reducing body temperature and infections, using multiple medications, alcohol withdrawal, male sex, severe diseases such as cancer, cerebrovascular and cardiopulmonary disease, malnutrition and burns, surgery and hospitalization in ICU and having a social psychological background.[8,12] Diagnosis methods and cognitive confusion in the intensive care unit is a standard tool in diagnosing the delirium and suffering from the syndrome is confirmed when the patients show mental status changes with sudden onset or variable periods, inattention with confused thinking or variable conscious level.[14] Currently, pharmacological and non-pharmacological strategies are recommended for delirium management.[15] Haloperidol is widely used as a pharmacological treatment method.[16] But, non-pharmacological strategies and nursing interventions to prevent the delirium are conducted by underlying factors as much as possible like, emotional support, slowly speaking with the patient, strengthening close communication and interaction and providing a quiet environment, assuring, refraining from urinary catheter insertion, preventing from body dehydration, reducing environmental noises, light reduction at nights to facilitate sleeping, back massage, music therapy and dividing nursing cares periodically to create continuous rest periods.[12,15] Reawareness strategies, making distraction, using stimulants like sound and light, precise controlling, educating the patient's family, giving freedom of movement to the inhibited patients also can be used.[17]

Delirium is known as "madness of every human being" to emphasize everyone, whether children or elderly, are potentially susceptible

to experience it[18,19] and can be associated with negative effects for the individual, organization and nurses at the forefront of the care.[8]

This study aimed to determine the effect of nursing interventions on delirium of the patients admitted to the neurosurgery ICU of Al-Zahra Hospital in 2009; i.e., the frequency distribution of irritability severity and the frequency distribution of delirium in the samples were compared before the intervention and on the fifth day of intervention in two intervention and control groups.

Methods

The single-blind, prospective clinical trial study was performed on 40 patients who were selected in a simple random sampling method and randomly placed into the two intervention and control groups.

The study environment was consisted of the neurosurgery ICU of one of the university hospitals affiliated to Isfahan University of Medical Sciences. The samples were selected among the patients with delirium who had characteristics of the study subjects. The inclusion criteria were an age range of 17 to 70 years old, obtaining written consent form all the official guardians of the study samples, minimum score of 9 for the level of consciousness and score of 6 for the movement based on Glasgow Coma Scale, no drug and alcohol addiction, no history of mental disorders such as dementia, psychosis or mental retardation, ability to speak or understand the Persian language and availability of the patients family and their favorite people. Furthermore, laboratory results, such as albumin, creatinine, urea and nitrogen, blood sugar, sodium, potassium, whole blood cell count, urinalysis and blood gas investigation should have been at the normal range and the patients should have obtained the +1 score or more from the Richmond Agitation Sedation Scale. The exclusion criteria included refusal of the family or the physician to continue participating in the study, obtaining the scores of -5 to -1 from the Richmond Agitation Sedation Scale in three consecutive occasions and discharging from the hospital/ICU or death of the study subject be-

fore the fifth day after diagnosis of delirium or lack of possible investigation on the patient for three consecutive occasions due to low level of consciousness and leaving the unit or hospital to perform diagnostic tests.

Data collection method in this study was interviewing the patients' family and the data collection tools included the questionnaire and documentary sources including files and patient's level of consciousness control chart. The mentioned questionnaire was consisted of three parts. The first part included individual characteristics such as age, sex, marital status, educational level, occupation and the type of disease. In the second part of the questionnaire, the irritability status and the patient's relieve were assessed by Richmond Scale that resulted on the rating score -5 to +4. In the third part of the questionnaire also, the patients' delirium status was assessed using the dizziness recognition assessment instrument in the ICU. Provided that the patient could obtain the required score in stage 1 (sudden onset and variable oscillating symptoms) and stage 2 (inattention) and one of the stages 3 or 4 (confused thinking) and (patient variable level of consciousness), he/she was identified as the patient with delirium in ICU.

Both applied tools in this study had high validity and reliability. In different studies, the dizziness assessment instrument in ICUs have had sensitivity and specificity higher than 90 to 95 percent (k = 0.96).[20] However, in order to obtain the validity of the data collection tool, the content validity method was used. Thus, the researcher gave the translated and original form of the tool to 15 professors and faculty members of Isfahan University of Medical Sciences and imparted their comments and revisions to complete the questionnaires. Moreover, the researcher, in addition to contact the clinical projects sector of Vanderbilt University of America, translated the Persian version to English and submitted it to that university to be reviewed by their researchers. After several revisions and modifications, the Persian translation was accepted and submitted and also was registered in Delirium Website for the

Persian-language users. In addition, in order to increase the questionnaire reliability, the correlation between the measurements and Condal coefficients consistency were performed by the researchers.

At the beginning of the study, the study population who had the inclusion criteria was assessed once every 24 hours in terms of the irritability severity. Provided with obtaining score of +1 and more, the study could be continued and individual characteristics and state of delirium could be completed. The patients in the control group only received normal and routine care such as injection of haloperidol based on the physician's order, unexpected and irregular visiting and communication between patients and nurses according to nurse's communication abilities. In the intervention group, despite receiving normal and usual cares, the patients also received nursing interventions as the following: clear information, effective communication, assurance and emotional support from the researcher, his partners and the nurses. The patients' families in the intervention group were allowed to have regular daily visits twice a day; once in the morning shift and once in the afternoon for 45 minutes. To avoid disrupting the nurses' work, the visiting time were arranged as 10 to 11 am in the morning and 4 to 5 pm in the afternoon.

Generally, the sampling was started on 2009.3.13 and ended on 2010.1.10. During this 10 months period, fifty-six patients entered the study from whom 16 patients excluded from the study list in the favor of exclusion criteria due to many factors such as: low consciousness level, changing hyperactive delirium to hypoactive delirium, death, discharging from ICU, constant changes in the determined laboratory results in the inclusion criteria and worsening the patient's clinical conditions.

Results

Analyzing the data was conducted using SPSS software and descriptive and inferential statistical methods. The results of the study indicated that there was no significant difference between the intervention and control group in terms of

characteristics such as gender, age, marital status, occupation status, educational level, type of disease, using surgery or no surgery, type of infection, smoking cigarette history, history of high blood pressure and seizures, lesions, the number of catheters attached to the patient, anesthesia duration, the period between the time of admission to the hospital and admission to the ICU and also duration of hospitalization in the ICU to enter the study and receiving painkiller.

This study showed that half of the patients in the intervention group were in chaotic status. In this group, the chaotic state was declined on the fifth day so that only two patients were in chaotic state and the number of the conscious and calm patients reached to 12 subjects (60%). Wilcoxon test in the intervention group showed that the study subjects had significant difference in terms the irritability severity (p < 0.001) which indicated reduction in the severity of irritability from the diagnosis day until the fifth day. In the control group, none of the samples were calm and conscious on the day of admission that this number was declined to 9 patients (45%) on the fifth day. Wilcoxon test showed that severity of irritability in the study subjects had a significant difference on the admission day and the fifth day (p < 0.001).

Besides, the obtained study results showed that in the intervention group, only 3 out of 20 patients with delirium on the admission day, still had delirium at the end of the fifth day meaning 85 percent had no delirium and were recovered. McNemar test showed that the number of the subjects with delirium on the fifth day reduced compared to the admission day and there was a significant difference between these two days (p < 0.001). In the control group, 12 out of 20 patients with delirium on the admission day, (60%) still had delirium at the end of the fifth day. McNemar test in this group showed that the number of subjects with delirium at the fifth day had a significant reduction in comparison with the diagnosis day and there was a significant difference between these two days (p < 0.001).

Discussion

Following the admission of the patients in the intensive care unit which is an unfamiliar environment for them, anxiety and stress would be created in all the patients, whether the patients of intervention or control group, and gradually, following the familiarization of the patients with the environment, staff and type of the provided care, the stress would be reduced. Therefore, it is expected that restlessness and confusion rate of the patients increase on the first days of admission to ICU, but it would be decreased over the time. As indicated in the study, process of anxiety and turbulence reduction of the patients in the intervention group was faster than in the control group so that in the intervention group, there was no patient in severe trouble and chaotic situation on the fifth day, but in the control, two patients were very chaotic and only nine patients were conscious and calm. Therefore, despite significant difference between the results of the two groups, the number of the patients in conscious and calm status which is optimal and desired was higher in the intervention group.

In the study of Tiersky et al by conducting interventions such as neuropsychological and cognitive rehabilitation for the samples, the intervention group showed higher reduction of anxiety and depression than in the control group.[21] In fact, there was a significant difference between turbulence reduction in the intervention group in comparison with the control group in one and three months after conducting the intervention (p ≤ 0.05).

Delirium is a phenomenon which its incidence is possible at the time of admission in ICU which also is depended upon current predisposing and accelerator factors. However, studies indicated that delirium would spontaneously be reduced over a week unless the risk factors are not controlled. In this study also, the number of the patients with delirium reduced in both groups; there was 15% of the patients with delirium in the intervention group versus 60% of the patients with delirium in the control group on the fifth day. Therefore, despite a significant difference between the groups, it was

indicated that conducting nursing interventions could improve the patients' recovery by 85% in the intervention group which was almost twice as the control group.

Lundstrom et al (2005) also showed that by conducting interventions such as educating the staff with focus on recognition and evaluation, prevention and treatment of delirium and interaction between the patient and care providers and also reorganization of the care system from "task-oriented" to "patient-oriented", the number of the delirious patients in the intervention group was lower than in control group on the seventh day (p = 0.001).[22] On the other hand, in the study of Inouye et al (2003), intervention protocols such as conscious, treatment activities, mobility, performing non-pharmacological protocols for sleeping, removing vision and hearing defects, reviewing dehydration and its compensation, caused reduction in delirium rate (p = 0.002).[23] However, Milisen et al (2001) indicated that despite conducting intervention such as educating the nursing staff, regular cognitive screening, counseling services and regular use of pain control protocol, incidence of delirium in the intervention group did not have a significant reduction in comparison with the control group (p = 0.82). But severity and duration of delirium in the intervention group was lower than in the control group (p = 0.049).[24]

Researcher believed that multi-component interventions seems effective and desirable so that the entire nursing interventions altogether are needed to observe positive effects of treating delirium. In addition, conducting a study with longer duration of intervention along with measuring effective rate of each intervention can cover this restriction and also can help the present study to emphasize more to importance of nursing interventions and its development in the clinical environment. One of the problematic aspects of this study which caused prolongation of sampling time was exclusion of the subjects due to the various reasons. Therefore, conducting a study which can review and compare the delirium state of the patients even after they discharge from this unit and not only

focusing on ICU would be so valuable.

Nurses, due to more interaction with the patients, are in a unique position to review their mental status changes in an early stages[25] and also in addition to provide effective care and using technologies, they are needed to consider the patients' mental, social and human attitudes.[26] Delirium is a stressor sign for the patient and his/her family and efforts should be done to ensure all aspects of the disease including management and effective treatment of the symptoms are looked after.[27]

Conclusion

Totally, results of the present study can be effective on progression and development of the nursing interventions. The obtained results of the study can play an important role in order to increase the patients and their families' satisfaction, health care system staff, health administrators and policymakers. More importantly, implementing this study indicated that providing a move from close intensive care units toward open units was necessary.

The authors declare no conflict of interest in this study.

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