

The Effect of a Change in Staffing Policy for the Patient Safety in One Hospital

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Abstract. The study compared the incidence of adverse reactions to MRI contrast medium administrated by radiography technicians (RTs) with registered nurses (RNs). The adverse reactions occurred in 62 cases out of a total of 58,296 cases for 2 years. Adverse effects decreased from 43 cases in RT group to 19 cases in RN group. Occurrence rate of urticaria was lower in RN group than in RT group. Nausea, skin eruption, pain, itching, and anxiety were all decreased after RN's administration, but there were not statistically significant. Especially, there were 3 cases that patients wanted to stop MRI test due to severe anxiety in RT group, but there was no case after RN's administration. RNs will be fit for administration of MRI contrast medium in order to keep the patient safety.

Keywords: Patient safety, Medical staff, Adverse reactions

1 Introduction

Most emergency situations in radiology are related to contrast media, but it is difficult to predict adverse events [1]. Therefore, the director of the hospital must pay attention to prevent, predict the occurrence of reactions, and be responsible for providing proper services by posting sufficient personnel [2]. In Korea, in principle, a doctor must infuse the contrast media and keep observing a patient's condition [3], and nurses are allowed to do so by a Supreme Court case in Korea (1984) that infusion is the customary behavior of nurses so that infusion of contrast media also could be a proper role behavior of nurses. However, because of the nursing shortage, nurses have been placed the ward mainly, not the lab, and radiological technologists (RTs) infused the contrast medium following the bylaws of the hospital [2]. This is an illegal behavior beyond the range of duties of RTs according to a Supreme Court case in Korea (2000) and, some studies [4, 5] have reported several problems of RTs' management.

If this reality of customary staffing operations does not have a significant negative impact on patient safety, it needs to be reflected in the law as one of method to solve the nursing shortage. However, this illegal reality has a negative effect on patient safety, it must be considered the change of personnel management.

2 Method

2.1 Design and Sample

This study was to compare the incidence of adverse reactions to MRI contrast medium before and after staffing change. This study was conducted in one university hospital in Seoul. In this hospital, from September 2009, the policy was changed so that experienced nurses, instead of RTs, managed contrast media to strengthen patient safety. RTs managed 27,346 cases from September 2008 to August 2009, and nurses managed 30,950 cases from September 2009 to August 2010. The study was approved to collect data through electronic medical records from the hospital. The researchers received data file, containing only gender, age, and medical characteristics but no individually identifiable data.

2.2 Instruments

Adverse reactions. Adverse reactions complained of by patients or observed by the medical staff were urticaria, nausea, vomiting, skin eruption, pain, itching, or anxiety.

Status report for adverse reactions. A status report was filled out by nurses when adverse reactions occurred. This report had general information of the patient, type of contrast medium, adverse reactions, and first-aid treatment or other management after occurrence of adverse reactions.

2.3 Data Analysis

Data were analyzed using the SPSS 14.0 for Windows program. A t test or chi-squared test was used to identify the homogeneity between before and after changing the policy. The chi-squared test was employed for the identification of the difference in incidence of adverse reactions between before and after.

3 Results

Gender, age, site of the MRI test, and the state of the patients in the two periods were homogeneous. A total of 62 adverse reactions occurred. The number of adverse reactions decreased from 43 cases to 19 cases after changing the policy ($\chi^2=11.538$, $p=.001$). Looking in detail, the incidence of urticaria after changing the policy (11 cases) was lower than that before changing the policy (22 cases) ($\chi^2=5.176$ $p=.035$). Skin eruption, itching, nausea, vomiting, pain, or anxiety all reduced than before, but it was not statistically significant. There were 3 cases in which the patient wanted to stop the MRI test due to severe anxiety before changing the policy, but there was no case after changing the policy.

4 Discussion

In this study, after replacing into the RNs, the incidence of total adverse reactions and urticaria to contrast media decreased significantly. In 62 cases in which adverse reactions occurred, patient characteristics were homogeneous. It is a meaningful finding that the difference of incidence arises not from the characteristics of patients but from those of the staff who are responsible for managing the contrast media. Song [5] showed that the knowledge of RTs about the dangers of contrast media was high, but most of them called nurses in emergency situations because of insufficient education regarding emergency treatment or coping skills. This could be a factor threatening patient safety, and results in this study support it. Therefore, supervision of hospitals or related institutions about the appropriate personnel operation will be needed.

5 Conclusion

This study has several limitations. It is difficult to generalize the results because it is based on one hospital. The contents of the provided interventions needs to be identified more by the type of staff. Despite these limitations, this study provides empirical evidence that legitimate staffing has positive effects on patient safety. Therefore, the director of the hospital should make an effort to place nurses in all departments, not just the inpatient units.

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