

[Original Research]

Relationship between the Level of Opioid Stress and the Process of Administration Services

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Abstract: We investigated feelings of stress among nursing staff members who were directly responsible for administering opioids. We used a survey questionnaire with 13 items and a numeric rating scale (NRS). Nursing staff reported significantly more stress when handling opioids than other drugs. We termed this stress "opioid stress." More than 90% of staff reported stress related to changes in opioid dosage and administration. Results of the NRSs revealed that stress levels among nursing staff administering opioids were similar to those reported by nursing staff when handling a rescue. Of the various opioid formulations, nursing staff indicated that injected opioids were the most stressful due to the formulation and the importance of ensuring that procedures followed legal requirements. Pharmacists may be able to play a role in reducing opioid stress among nursing staff by supporting the entire procedure, from doctor's prescription to administration, as well as by supporting procedures that meet legal requirements.

Key words: nursing staff, opioid stress, administration process, questionnaire

INTRODUCTION

Narcotic analgesics (opioids) play an important role in controlling cancer-related pain through pharmacotherapy, and are important in maintaining patient quality of life (QOL).^{1,2)} Opioids are usually administered by nursing staff members in a hospital, and due to legal requirements, nursing staff must be more vigilant when managing opioids compared to other kinds of drugs. In addition, opioids are more complicated to manage because they are also prescribed for rescue situations at the time of breakthrough pain.^{3,4)} For these reasons, managing opioids may cause excessive stress among nursing staff. In particular, fewer nursing staff members work during night shifts, so they may be subjected to additional responsibilities.

Our goal was to develop a strategy for reducing occupational stress related to opioid administration. This study focused on whether opioid administration is in fact a cause of stress. We conducted a questionnaire survey about various stress factors related to opioid administration at Fukuoka University Hospital, Japan.

MATERIALS AND METHODS

Subjects were 97 nursing staff members (excluding head nurses) who worked in four wards of Fukuoka University Hospital where opioids were frequently administered. The nursing staff members were classified in two groups: those responsible for managing opioids in the ward (Group A) and those who directly administered opioids to patients under the direction of Group A nursing staff (Group B). A total of 87 nursing staff members participated in the study, and all were experienced in handling opioids. We made the definition of the opioid as the medicine routinely handled by a nurse, not as the restricted one. Group A included 37 subjects with an average of 10.9 ± 8.0 years of practical experience, and Group B consisted of 50 subjects with an average of 2.0 ± 1.4 years of practical experience. A questionnaire survey was distributed to participants (Table 1). This questionnaire is based on a paper by Hsu H. C. (2007)⁵⁾ and Skinner V. et al. (2007).⁶⁾ Statistical analyses were conducted using SPSS (SPSS Japan, Tokyo, Japan), and significance was set at $p < 0.05$. Differences between the groups were compared using the Mann-Whitney test. Values are shown as the mean \pm standard deviation.

RESULTS

Overall, 29 of the 37 subjects (78%) in Group A and

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Table 1 Questionnaire Sheet

Q1. Do you feel stress when handling opioids?
(1) yes (2) no

Q2. On a scale of 0 to 10, how much stress do you feel when handling opioids and other drugs?
(1) Opioids-NRS (2) Other drugs-NRS

Q3. What impressions do you have about opioids?
(More than one response may be selected.)
(1) drugs developing addiction
(2) analgesics for the terminal stage
(3) strong analgesics
(4) drugs causing delirium
(5) drugs easily developing tolerance
(6) other

Q4. At which times are you most likely to handle opioids?
(More than one answer may be selected.)
(1) 0 to 5 h
(2) 6 to 11 h
(3) 12 to 17 h
(4) 18 to 23 h

Q5. Which process causes you the most stress?
(1) receiving instructions from doctor (2) acceptance/arrangement (3) preparation
(4) administration (5) cleanup (6) return

Q6. At which time are you most likely to feel stress?
(1) 0 to 5 h (2) 6 to 11 h (3) 12 to 17 h (4) 18 to 23 h

Q7. Do you feel stress when the dosage of opioids is suddenly changed?
(1) yes (2) no

Q8. On a scale of 0 to 10, how much stress do you feel in the situation outlined in Q7?
NRS

Q9. Do you feel stress when the formulation of opioids is changed?
(1) yes (2) no

Q10. Which formulation of opioids do you find the most stressful to administer?
(1) tablet (or capsule) (2) oral solution (3) powder
(4) suppository (5) dermal patch (6) injectable solution

Q11. Do you feel stress when handling a rescue?
(1) yes (2) no

Q12. What part of a rescue causes you stress?
(More than one answer may be selected.)
(1) period of preparation
(2) a call from a patient due to irregular pain
(3) interval period between each rescue
(4) asking patients to rate pain on a numeric rating scale
(5) administration of opioids is stressful regardless of the rescue
(6) numerous varieties of opioids
(7) other

Q13. On a scale of 0 to 10, how much stress do you feel when handling a rescue?
NRS

39 of the 50 subjects (78%) in Group B reported stress related to handling opioids (Table 2). The questionnaire measured the degree of stress related to handling opioids using a numeric rating scale (NRS) from 0 to 10, with 10 indicating maximum stress. Groups A and B did not differ significantly in this regard: values were 6.9 ± 1.7 and 6.2 ± 1.8 , respectively ($p = 0.16$). Additionally, Groups A and B differed significantly in other drugs: values were 3.8 ± 0.9 and 3.2 ± 1.0 , respectively ($p = 0.03$). In contrast, stress levels differed significantly between opioids and other drugs ($p < 0.01$; see Fig. 1), and in both groups ($p < 0.01$; see Fig. 2). Respondents ranked strong analgesics as the most stressful: 21 of the 62 subjects (34%) in Group A and 39 of the 95

subjects (41%) in Group B. Some respondents reported that “legal requirements are very bothersome” or “side effects often occur.” Respondents ranked the period from 6 to 11 h as the most common time for handling opioids, followed by 18 to 23 h, 12 to 17 h, and 0 to 5 h in both groups. With regard to the process of handling opioids, most participants (13 of the 29 subjects or 45%) in Group A reported that stress levels were highest at the time of “administration,” followed by 11 (38%) who reported highest stress levels when “receiving instructions from the doctor.” In contrast, most participants (16 of the 39 subjects or 41%) in Group B reported that stress levels were highest at the time of “preparation,” followed by 15 (38%) who reported highest stress levels

Table 2 Questionnaire Results

Item	Group A	Group B	<i>p</i> -value
Q1. Do you feel stress when handling opioids?			
(1) yes	29	39	
(2) no	8	11	
Q2. On a scale of 0 to 10, how much stress do you feel when handling opioids and other drugs?			
Opioids-NRS (mean \pm s.d.)	6.9 \pm 1.7	6.2 \pm 1.8	<i>p</i> = 0.16
Other drugs-NRS (mean \pm s.d.)	3.8 \pm 0.9	3.2 \pm 1.0	<i>p</i> = 0.03
Q3. What impressions do you have about opioids? (More than one response may be selected.)			
(1) drugs developing addiction	4	13	
(2) analgesics for the terminal stage	12	13	
(3) strong analgesics	21	39	
(4) drugs causing delirium	2	7	
(5) drugs easily developing tolerance	9	15	
(6) other	14	8	
Q4. At which times are you most likely to handle opioids? (More than one response may be selected.)			
(1) 0–5 h	6	6	
(2) 6–11 h	33	40	
(3) 12–17 h	10	9	
(4) 18–23 h	32	37	
Q5. Which process causes you the most stress?			
(1) receiving instructions from doctor	11	1	
(2) acceptance/arrangement	1	3	
(3) preparation	1	16	
(4) administration	13	15	
(5) cleanup	0	4	
(6) return	3	0	
Q6. At which time are you most likely to feel stress?			
(1) 0–5 h	5	10	
(2) 6–11 h	6	9	
(3) 12–17 h	1	1	
(4) 18–23 h	17	19	
Q7. Do you feel stress when the dosage of opioids is suddenly changed?			
(1) yes	27	36	
(2) no	2	3	
Q8. On a scale of 0 to 10, how much stress do you feel in the situation outlined in Q7?			
NRS (mean \pm s.d.)	7.7 \pm 1.6	7.3 \pm 1.3	<i>p</i> = 0.38
Q9. Do you feel stress when the formulation of opioids is changed?			
(1) yes	14	23	
(2) no	15	16	
Q10. Which formulation of opioids do you find the most stressful to administer?			
(1) tablet (or capsule)	0	3	
(2) oral solution	1	1	
(3) powder	1	2	
(4) suppository	1	0	
(5) dermal patch	1	3	
(6) injectable solution	10	14	
Q11. Do you feel stress when handling a rescue?			
(1) yes	17	29	
(2) no	20	21	
Q12. What part of a rescue causes you stress? (More than one response may be selected.)			
(1) period of preparation	8	19	
(2) a call from a patient due to irregular pain	1	7	
(3) interval period between each rescue	2	12	
(4) asking patients to rate pain on a numeric rating scale	9	13	
(5) administration of opioids is stressful regardless of the rescue	3	19	
(6) numerous varieties of opioids	1	2	
(7) other	3	0	
Q13. On a scale of 0 to 10, how much stress do you feel when handling a rescue?			
NRS (mean \pm s.d.)	7.6 \pm 1.7	7.0 \pm 1.8	<i>p</i> = 0.58

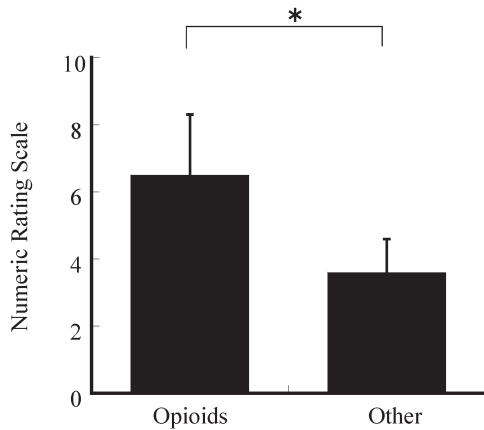


Fig. 1 Comparison of numeric rating scale (NRS) results for stress between opioids and other drugs. Results indicated that stress levels were greater for opioids than other drugs. *, $p < 0.01$. $n = 68$.

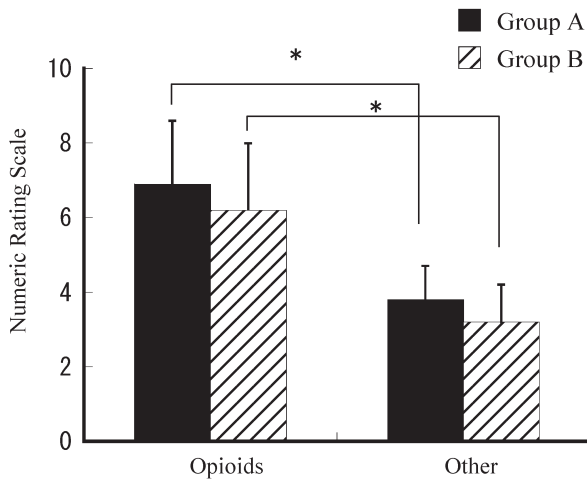


Fig. 2 Comparison of numeric rating scale (NRS) results for stress between opioids and other drugs in both groups. Results indicated that stress levels were greater for opioids than other drugs in both groups. *, $p < 0.01$. Group A $n = 29$, Group B $n = 39$.

at the time of “administration.” Participants in both groups reported most stress when handling opioids from 18 to 23 h: 17 of the 29 subjects (59%) in Group A and 19 of the 39 subjects (49%) in Group B. Participants in both groups reported stress when a dosage of opioids was suddenly changed: 27 of the 29 subjects (93%) in Group A and 36 of the 39 subjects (92%) in Group B. NRS values for stress caused by sudden changes in dosage and administration were 7.7 ± 1.6 for Group A and 7.3 ± 1.3 for Group B; the difference was not significant ($p = 0.38$). About half of respondents reported stress related to different formulations: 14 of the 29 subjects (48%) in Group A and 23 of the 39 subjects (59%) in Group B. The injectable solution was the most stressful formulation for 10 of these 14 subjects (71%) in Group A

and 14 of these 23 subjects (61%) in Group B. Of the 37 subjects in Group A, 17 (46%) reported stress when handling a rescue; of the 50 subjects in Group B, 29 (58%) reported stress when handling a rescue. Respondents in Group A indicated that the most stressful parts of handling a rescue were “asking patients to rate pain on a numeric rating scale” (9 of 27 subjects or 33%) and “period for preparations” (8 of 27 subjects or 30%). Respondents in Group B indicated that the most stressful parts of handling a rescue were “period of preparation” (19 of 72 subjects or 26%) and “administration of opioids is stressful regardless of the rescue” (19 of 72 subjects or 26%). The groups did not differ significantly in NRS values for stress related to handling a rescue: 7.6 ± 1.7 in Group A and 7.0 ± 1.8 in Group B ($p = 0.58$).

DISCUSSION

1. Opioid stress

Our results confirmed that nursing staff members felt significantly more stress when handling opioids compared to other drugs. We termed this condition “opioid stress.” Responses from several subjects provided some possible reasons for this stress: some noted “legal requirements are very bothersome” in their responses to an open-ended question. The most stressful time period for handling opioids was from 18 to 23 h, when fewer staff members were working. Therefore, both the acts of handling and the feeling of responsibility cause stress among nursing staff. Some subjects reported negative impressions about opioids,^{7,8)} such as “analgesics used only for the terminal stage” and “drugs easily developing tolerance.” Therefore, dispelling this kind of misconception or bias is important. It will be the role of pharmacists to support nursing staff members and correct their knowledge about opioids.

2. Handling

Our findings revealed that most nursing staff members felt stress when preparing, changing the dosage, and administering opioids. NRS values did not differ significantly between a rescue and a period of opioid preparation. Both processes require nursing staff to confirm the dosage and handle the opioid correctly within a certain time. This result confirmed that the handling process posed a tense situation for nursing staff. Consequently, pharmacists should play an active role in supporting nursing staff in the handling process. Double-checking that the dosage is correct may enhance communication with nursing staff.

3. Responsibility

Nursing staff members felt stress from the responsibility of carrying out their task until the opioid had been administered correctly to the patient. The two groups had different responsibilities for opioid management. Nursing staff members in Group A had to ask other staff members to follow the doctors’ instructions precisely. Staff in Group B had to prepare opioids and administer them directly to patients. Despite the differing roles and responsibilities, NRS values for stress did

not differ between the groups. Stress among Group A was probably caused by anxiety about administration, and stress among Group B was probably caused by the preparation of opioids, as described above. Therefore, to reduce the feelings of responsibility among nursing staff, pharmacists should be involved in the entire process, from the doctor's instruction to administration.

4. Legal requirements

Opioids involve strict administrative duties imposed by law, such as guarded storage and administrative management.⁹⁾ Nursing staff may find the requirements for opioids more trying than for other drugs. Our findings particularly indicated that the injectable formulation causes the most stress. A direct receipt is required from the Department of Pharmacy as an additional operation for handling. Furthermore, during individual preparation, some nursing duties, such as cutting an ampoule or preparing a syringe set, may cause additional tension. The obligation to return the empty ampoule also requires more complicated management and observation compared to other formulations. **The strict administrative management of opioids described above are performed with the operative standards guidelines created by Department of Pharmacy under Narcotics and Psychotropics Control Act.** At the same time, some medical staff without sufficient legal knowledge and interpretation might consider the opioid management as a troublesome job and feel stress as well. Accordingly, the pharmacist should take in the legal requirements actively and educate nurses and other staff.

This study clarified the factors related to opioid stress among nursing staff. The findings indicate that pharmacists should support smooth operation of nursing duties

and the security of reliable medical care, thereby reducing stress among nursing staff.

REFERENCES

- 1) Bansal M, Mohanti BK, Shah N, et al. Radiation related morbidities and their impact on quality of life in head and neck cancer patients receiving radical radiotherapy. *Qual. Life Res.* 2004; 13: 481-488.
- 2) Murakawa K, Moriyama K, Yanagimoto F, et al. Opioid analgesics for cancer pain. *Pain Clinic* 2008; 29: 583-598.
- 3) Zeppetella G, O'Doherty CA, and Collins S. Prevalence and characteristics of breakthrough pain in cancer patients admitted to a hospice. *J. Pain Symptom. Manag.* 2000; 20: 87-92.
- 4) Zeppetella G and Ribeiro MD. Pharmacotherapy of cancer-related episodic pain. *Expert Opin. Pharmacother.* 2003; 4: 493-502.
- 5) Hsu HC, Kung YW, Huang HC, et al. Work stress among nursing home care attendants in Taiwan: A questionnaire survey. *Int. J. Nurs. Stud.* 2007; 44: 736-746.
- 6) Skinner V, Agho K, Lee-White T, et al. The development of a tool to assess levels of stress and burnout. *Aust. J. Adv. Nurs.* 2007; 24: 8-13.
- 7) **Reid CM, Goberman-Hill R, and Hanks GW.** Opioid analgesics for cancer pain: Symptom control for the living or comfort for the dying? A qualitative study to investigate the factors influencing the decision to accept morphine for pain caused by cancer. *Ann. Oncol.* 2008; 19: 44-49.
- 8) Peker L, Celebi N, Canbay O, et al. Doctors' opinions, knowledge and attitudes towards cancer pain management in a university hospital. *Agri* 2008; 20: 20-30.
- 9) **Wellman GS, Hammond RL, and Talmage R.** Computerized controlled-substance surveillance: Application involving automated storage and distribution cabinets. *Am. J. Health Syst. Pharm.* 2001; 58: 1830-1835.