



ORIGINAL ARTICLE

Early predictors of narcotics-dependent patients in the emergency department

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Abstract It is not unusual that narcotics-dependent patients fulfill their medical requirements in the emergency department (ED). The behavior of these patients varies, and their manifestations and predictors are still not fully studied. We performed this retrospective study by prospectively collecting data on patients with suspected drug dependence who were undiagnosed at first and then treated for some kind of reported pain at the ED. Patients who were confirmed to have narcotics dependence were compared with control patients in a ratio of 1:3 matching for age, gender, disease, and clinical diagnoses. From January 2006 to October 2009, 26 of 223 patients treated for pain were found to be drug dependent (12 males and 14 females). The average dose of narcotics used was higher than the control group [3.23 ± 1.14 vs. 1.12 ± 0.36 , $p < 0.001$, confidence interval (CI): 1.648–2.583]. Numbers of patients making unscheduled returns to the ED within 24 hours were significant [24/26 vs. 8/78, $p \leq 0.001$, odds ratio (OR) 105.00, 95% CI 20.834–529.175]. In addition, patients showing aggressive attitudes were significant (17/26 vs. 2/78, $p < 0.001$, OR 71.78, 95% CI 14.206–362.663). In the case group, six of them told the physician that they were allergic to medicines other than the particular one they wanted, and three of the six presented injuries that were reported to be in the same (or repeated) place for unscheduled returns, which were not found in the control group. In this study, some behaviors were commonly observed in the at-risk group. These patients were prone to manifest some types of symptoms and behaviors, such as uncontrolled pain with three doses of analgesics, aggressive attitude, returning to the

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ED within 24 hours with the complaint of the same severe pain, repeating the same injury, claiming allergy to other analgesics, and asking for certain analgesics. All these behaviors should alert the physician to suspect a drug-seeking problem.

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Introduction

Drug dependence is a common problem that has already extended to all ethnic groups and social classes worldwide [1]. Results of previous studies show that approximately 10% of the general population has a problem of substance abuse [2,3]. Drug abuse and drug dependence represent different ends of the same disease process, and patients with these problems may present to the emergency department (ED) seeking substitutes. Nevertheless, few studies have focused on patient clinical behavioral manifestations in the ED [4–8].

The ED is a place where patients seek treatment and consolation. It is also a place where people receive pain relief drugs. In some circumstances, people who have problems of drug dependence and desire to obtain a particular substance may go to the ED for help with different excuses or manifestations [9]. If these people have injuries or accidents, their behavior patterns make it difficult to identify the risk properly, which may be complicated by the patients' unconsciousness, reluctance, or medical inability to give a detailed history about substance use [10]. Although there are some studies in the literature regarding the association between drug dependence and screening in emergency rooms, previous studies have seldom mentioned how to identify these patients with substance dependence and the different behaviors in the ED.

Because medical staff with a busy daily workload may ignore the signs in these particular patients and may prescribe analgesics routinely, these patients hang around the EDs, which have a special environment and easy access, of different hospitals for more doses of medicines. Some of these patients will lose their temper when not getting more doses and may show aggressive behaviors, which may interrupt the regular work of the ED. As such patients may go to the EDs seeking substances, it is important for ED physicians to know their behavioral manifestations and respond early so as to consider further treatment before prescribing narcotic analgesics for these patients. Because fewer studies have focused on the early identification of these patients in the ED, we conducted this study for identifying the clinical presentations and manifestations of drug-dependent patients and how they differ from patients without drug dependence.

Patients and methods

Patients and setting

This study was a hospital-based, retrospective study with prospective data collection. The study hospital provides

medical center-level health care and serves 80,000 ED visits per month in a metropolitan area of southern Taiwan. The study included patients who presented with pain to our hospital and patients who received more than one dose of analgesics. This included more than one dose of some nonsteroidal antiinflammatory medicine, and narcotic medicines such as meperidine (Demerol), morphine, tramadol (Tramtor), or nalbuphine (Nubain). The study protocol was approved by the Institutional Review Board of the study hospital.

Patients who were included in this study were those without prior diagnosis of drug dependence before visiting our ED. The case group included patients with a final diagnosis of drug dependence made by a psychologist consulted during the ED visits, or those later referred to an outpatient clinical service of psychiatry. Patients whose pain was caused by cancer were excluded. We also excluded patients who did not have complete chart records or who did not come back for follow-up in our outpatient clinic with definitive diagnosis. Patients who had injuries with an Injury Severity Score (ISS) greater than 16 were excluded. If the presentation of abdominal pain had other findings which required surgical intervention, then such cases were also excluded. Patients in the control group were those without any findings of drug dependence. Their medical charts were also reviewed and computerized by an ED physician and supervised by a senior physician. Final diagnoses of drug dependence were made by a psychologist.

Data collection, matching, and definition of terms

Detailed data, including demographics, causes of pain, doses of narcotics, returning to the ED within 24 hours, aggressive behaviors, allergic reaction to other analgesics or asking for certain analgesics, diagnosis of drug dependence, and duration of stay in the ED were recorded. Drug dependence is defined as compulsive use of a substance despite negative consequences that can be severe.

The aggressive behaviors included agitation, having arguments with medical providers, and violent behaviors based on the record in the chart by physicians and nurses. Narcotics refer to opium, opium derivatives, and their semisynthetic or fully synthetic substitutes that have the potential for addiction. Case and control patients (patients without drug dependence) were matched for age (± 3 years), gender, and diagnoses in a 1:3 ratio for the same period in the ED. Another physician who selected the control patients was blind to the purposes of the study.

The patient's unscheduled return to the ED was defined as when the patient returned to our ED within 72 hours for any reasons except for being scheduled or asked by physicians to return owing to their diagnosis. Total doses of

analgesic administration were calculated by combining the doses used in unscheduled returns. Time for more analgesic was defined as the period between the administration of analgesics in the same ED course. A standardized form for chart record was used to collect the data after the patient was enrolled.

Diseases of the patients were finally grouped into the following categories: lower abdominal pain and abdominal pain without specified diagnosis, urinary tract infection (UTI), and chronic pancreatitis. The ISS is an anatomical scoring system that provides an overall score for patients with multiple injuries. Each injury is assigned an Abbreviated Injury Scale (AIS) score, allocated to one of six body regions [head, face, chest, abdomen, extremities (including pelvis), and external]. Only the highest AIS score in each body region is used. The three most severely injured body regions have their scores squared and added together to produce ISS [11].

Intervention

At first, patients were treated at the ED for their primary complaints. Pain score was measured by a visual analogue scale. The patient marked on the line the point that they felt best represented their perception of their current pain state. Analgesics were given according to the patient's subjective feeling. During treatment, if patients were suspected to have a drug dependence problem by the ED physicians or nurses without improvement of pain after administering several doses of analgesics, they would be asked to follow-up at the psychiatric outpatient clinic or to consult a psychologist for further diagnosis and management. Patients who did not have a definite diagnosis by specialists were excluded.

Statistical analysis

Patients' demographics and selected variable relationships were characterized using descriptive statistics using the mean, standard deviations, and percentages. The Fisher exact test was used to compare aggressive behaviors and returning to the ED within 24 hours between genders. A Mann–Whitney *U* test was used to compare doses of narcotic analgesic, age, and time before asking for another dose after injection, between gender and the two groups. A *p* value <0.05 was considered to be statistically significant. All statistical operations were performed using SPSS 15.0 for Windows (SPSS Inc., Chicago, IL, USA).

Results

From January 2006 to October 2009, 223 patients who received more than one dose of analgesics met the criteria of our study. Twenty-six of the 223 patients had diagnoses of drug dependence by psychologists (12 males and 14 females). Their age was 31.62 ± 7.70 years, time of asking for more analgesics after the first injection was 4.88 ± 0.86 hours, and doses of narcotic analgesic used were 3.23 ± 1.14 . The major problems relating to the pursuit of analgesics of these patients could be categorized into UTI (30.8%, 8/26), injury (19.2%, 5/26), pancreatitis (chronic

(23.1%, 6/26), abdominal pain (19.2%, 5/26), and lower back pain (7.7%, 2/26). Furthermore, 92.3% (24/26) of the patients returned to the ED within 24 hours, and 65.4% (17/26) of the patients showed aggressive behaviors in the ED. Among the male patients, six of them presented with pancreatitis, three had pain caused by some kind of injury, two had nonspecific abdominal pain, and one had lower back pain. Of the 14 female patients, three presented with nonspecific abdominal pain, eight were confirmed to have urogenital tract infection, two had some type of injury, and one patient had lower back pain. Finally, 23 (88%) patients had their pain controlled by receiving meperidine (Demerol) injection in our ED and 86% of them received the same pain control medication during their second visit to the ED.

There were no significant differences between genders in age ($p = 0.149$) and doses ($p = 0.300$). There were also no differences between sexes in aggressive behaviors ($p = 0.613$) and time for asking for more doses of narcotic analgesic ($p = 0.277$). However, there were significant differences in disease presentation between genders ($p = 0.006$). A majority of male patients had pancreatitis (50%), while UTI was the major disease found in female patients (57%) (Table 1).

The case and control groups were matched in a ratio of 1:3 for diseases (Table 2). Age (34.07 ± 9.24 vs. 40.90 ± 15.79 , $p = 0.556$) and gender (14/26 vs. 45/78, $p = 0.158$) between the two groups had no significant differences. When comparing the dose of narcotic analgesics used between the two groups, the drug-dependent patients had higher doses than the control group [3.23 ± 1.14 vs. 1.12 ± 0.36 , $p < 0.001$, confidence interval (CI) 1.648–2.583]. In addition, the percentage of aggressive attitude was higher in the drug-dependence group than in the control group [17/26 vs. 2/78, $p < 0.001$, odds ratio (OR) 71.78, 95% CI 14.206–362.663]. While comparing unscheduled returns to the ED between the two groups, the drug-dependent group had a higher returning rate than the control group (24/26 vs. 8/78, $p \leq 0.001$, OR 105.00, 95% CI

Table 1 Demographic characteristics of patients with drug dependence.

Parameters	Males (<i>n</i> = 12)	Females (<i>n</i> = 14)	<i>p</i>
Age (y)	36.83 ± 9.91	31.71 ± 8.67	0.149*
Doses	3.50 ± 1.45	3.00 ± 0.78	0.300*
Time for more analgesic (h)	4.67 ± 0.778	5.07 ± 0.917	0.277*
Aggressive behaviors (<i>n</i>)	8	9	0.613**
Disease (<i>n</i>)			
UTI	0	8	—
Injury	3	2	—
Pancreatitis	6	0	—
Abdominal pain	2	3	—
Lower back pain	1	1	—

**p* based on Mann–Whitney *U* test.

***p* based on χ^2 test.

UTI = urinary tract infection.

Table 2 Demographics and averaged physiologic parameters and variables in both groups.

Variables	Drug dependence (n = 26)	Control (n = 78)	p
Age(y)	34.07 ± 9.24	40.90 ± 15.79	0.556*
Female	14/26	45/78	0.158**
ED diagnoses of diseases	—	—	1.000**
UTI	8	24	—
Injury	5	15	—
Pancreatitis	6	18	—
Abdominal pain	5	15	—
Lower back pain	2	6	—
Dose of analgesics	3.23 ± 1.14	0.27 ± 0.50	<0.001
Aggressive attitude	17/26	2/78	<0.001
Unscheduled returns to the ED	24/26	8/78	<0.001

*p based on Mann–Whitney U test.

**p based on χ^2 test.

ED = emergency department; UTI = urinary tract infection.

20.834–529.175). In the case group, six of them told the physician that they were allergic to medicines other than the one they named that they wanted, while none of the patients in the control group exhibited such behaviors. Three of the six presented injuries were reported to be in the same (or repeated) place for unscheduled returns while this was not found in the control group.

Discussion

Pain control is an important issue in the ED. Up to 42% of all ED visits by patients are to seek a solution for the problem of pain [7,12]. Among these patients, some may have narcotic addiction, which makes them a difficult group to manage in the ED [13]. Their presentations vary. In our study, the unscheduled return, aggressive attitude, medication refill, repeating the same injury, claiming allergy to other analgesics, and asking for certain analgesics may indicate narcotic dependence.

Drug dependence affects people of all ages, all races, and all socio-economic strata [14]. The ED is an important site for identifying those with substance-use problems and for initiating a brief intervention [15]. Sometimes it is difficult to detect such problems in the ED because patients will combine these with other presented medical problems. In our study, there were some common behaviors such as uncontrolled pain with high doses of analgesics, aggressive attitude, returning to the ED within 24 hours with the same severe pain, repeating the same injury, allergic to other analgesics, and asking for certain analgesics, any combination of which tends to indicate drug dependence.

A person who depends on drugs may not realize that he or she has a problem, may not be willing to talk or may not even know about the problem, which will make it difficult for the physician, or even a psychologist, to the diagnose his or her condition [16–18]. The Mayo Clinic defines drug addiction as “compulsively seeking to use a substance, regardless of the potentially negative social, psychological and physical consequences”. Addiction to drugs and other substances always involves lack of control and repeated inability to take personal responsibility for behaviors

[19,20]. In our patients, some would pretend to have an injury just to obtain narcotic analgesics, with some even committing self-inflicted injuries. In the male patients with pancreatitis, repeated consumption of alcohol to induce severe pain was also found. They would also receive invasive surgical intervention just to obtain further analgesics and return to the ED for pain relief.

We also found there were some different symptom patterns between male and female patients. Major problems related to pain were one of the manifestations of narcotic dependence between genders. Males were more easily affected by pancreatitis caused by alcohol, while females were more prone to have lower abdominal pain with UTIs. Aggressive behaviors had no significant difference between male and female patients. There was no difference between genders in returning to the ED within 24 hours. The desire to obtain a particular substance may drive the patient back to the ED because they had received the substance. According to our study, 86% of the patients could get the same pain-control medicine during their second visit to the ED. Therefore, once their desire was satisfied, they would come back asking for more.

Meperidine (Demerol) is a particular pain-control medication widely used by physicians in Taiwan. Twenty-three (88%) patients received pain control via meperidine (Demerol) injection in our ED. Six of our patients told the physician that they were allergic to medicines other than meperidine, and directly asked for a meperidine injection. This is also a hint of drug dependence. Besides, drug dependence may have a relationship to the prescriptive habit of physicians because our physicians prefer to prescribe meperidine more than other pain-control drugs.

Early detection and intervention of the narcotic patients is very important. Because of the emergency physicians' frequent changes in shift timings, when patients present to the busy ED with acute pain, it is not difficult for them to get analgesics before the physician makes a final diagnosis. In addition, if the ED is over-crowded, patients may get pain control first, which can be considered as an administrative defect. Further intervention will not be possible for these patients because of the limited resources in the ED. Therefore, hospital management should intervene in such

problems instead of allowing them to happen [21–23]. In our hospital, patients are transferred to the pain clinic and monitored by the Narcotics Review Committee. As a result, their returning times to the ED decreased.

Although we did not know whether the patients went to other hospitals for help, the 24-hour returning rates of these 23 patients did decrease. Half of the patients are still receiving treatment in the pain clinic. Therefore, intervention by hospital management is very important. Because the ED has limited resources to intervene with these patients, without the aid of the committee, these patients would still wait around the ED and ask for a narcotics injection. As a corollary, such behaviors described could intensify and be a danger to other patients, the medical staff, and the presenting drug-dependent patients themselves.

Limitation

There are some limitations to this study. First, it is a single institution experience, and may only reflect the characteristics of local patients; however, although our hospital provides medical center service, it is located in the center of the city and receives all types of patients because of government policy. Second, only a small number of patients met the entry criteria, which may lead to results with no significant difference and may not present a conclusive matrix. However, we used the case control study with a matching ratio of 1:3 to increase the power of the statistical analysis. In addition, the diseases were divided into five categories and may not reflect differences in the details. Patients might receive different narcotic analgesics in the same course of the ED treatment, but their response or reaction to pain control may be different. Furthermore, medical chart records may not sufficiently detail the agitation of every patient and this variant may be underestimated. Despite these limitations, it appears that the current study confirms some findings from previous investigations in this area and provides the emergency physician with a simple yet reliable tool for initiating treatment in patients with narcotic dependence. Further prospective studies may be carried out to investigate the relationship between the prescriptive habits of physicians and drug dependency of patients.

Conclusion

In conclusion, when patients visit ED for pain control, some of them may have drug addiction while the majority may not. Drug dependence can only be suspected by the emergency physician, because the final diagnosis of addiction would need to be confirmed by professional psychologists. Nevertheless, these patients may have some common behaviors, such as uncontrolled pain with three doses of analgesics, aggressive attitude, returning to the ED within 24 hours with the same severe pain, repeating the same injury, claiming allergy to other analgesics, and asking for specific analgesics, which may help the physician to clarify his or her suspicions about drug dependence, thereby initiating further intervention.

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