Journal of Acute Disease

Original Article

doi: 10.4103/2221-6189.326910 jadweb.org

Drug dependence and its risk factors in emergency department patients: A retrospective cross-sectional study

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ABSTRACT

Objective: To determine the characteristics and risk factors of drug dependence among patients who were administered drugs with addictive potential (DAP) in an emergency department (ED).

Methods: This retrospective cross-sectional study included patients who were administered DAP 3 or more times in the emergency room between September 1, 2019 and March 1, 2020. The demographic and baseline information were recorded. All the prescibed DAP, the reasons to use these drugs, secondary drug dependence, the department where DAP were first prescribed, types of doctors who preferred to prescribed DAP, and the risk factors for the development of drug dependence were determined.

Results: A total of 3 000 patients were screened from medical records, and among them, 80 patients developed drug dependence. Drug dependence only developed for tramadol (*n*=57, 71.3%), diazepam (*n*=11, 13.8%), and biperiden (*n*=12, 15.0%). Tramadol was the most frequently prescribed drug (*n*=57, 71.3%). The most common reason for drug dependence was psychiatric disorders (*n*=29, 36.3%). Drug dependence developed in renal colic patients due to the administration of tramadol (*n*=7, 100%). On the contrary, dependence to biperiden were mainly developed in patients with psychiatric complaints (*n*=12, 41.4%). The rate of secondary drug dependence was 15% (*n*=12). Of the Biperiden users, 41.7% developed secondary drug dependence on diazepam. Most DAP were first prescribed in the ED (*n*=52, 65%), and the specialist preferred to prescribe DAP (*n*=43, 53.8%). For the development of dependence, the presence of renal colic (*OR*: 3.387, 95% confidence interval (*CI*): 1.473-7.788, *P*=0.004) and low back pain (*OR*: 5.778, 95% *CI*: 2.779-12.014, *P*<0.001) were the risk factors.

Conclusions: Most DAP were first prescribed in the ED compared to other departments, and specialist are preferred to use DAP. Tramadol is the most commonly used drugs caused drug dependence. Psychiatric disorder patients are easier to develope drug dependence. Furthermore, renal colic and low back pain patients needs more attention to avert drug dependence.

KEYWORDS: Drug with addictive portential; Drug dependence; Emergency room; Risk

1. Introduction

Drug dependence is an important global problem in terms of socioeconomic and public health[1-5]. In the United States of

Significance

As the risk of drug dependence keeps rising worldwide, this issue gets more and more concerns, especially in emergency department. Our study shows that tramadol is the most commonly used drug caused drug dependence in the emergency department, and psychiatric disorder patients are easier to develope this issue. Besides, low back pain and renal colic were identified as the risk factors.

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How to cite this article: Yavuz E, Turgut K, Gulacti U, Lok U, Altunisik E. Drug dependence and its risk factors in emergency department patients: A retrospective cross-sectional study. J Acute Dis 2021; 10(5): 202-207.

Article history: Received 12 May 2021; Revision 26 July 2021; Accepted 14 August 2021; Available online 4 October 2021

America, more than 841 000 people died of drug overdose since 1999, and opioid-related issues was occupied more than 70% of drug overdose deaths in 2019[3]. Besides, there is a quite high proportion of repeated admission to the hospital among these cases.

Measures to control highly drugs with addictive potential (DAP) vary among countries. Narcotic drugs include antipsychotics, sedatives, and opiate analgesics that are subject to a special prescription due to their high addictive levels. This constitutes a group of drugs for which the use and disposal information should be monitored by the World Health Organization. In addition, the records of highly DAP are regularly kept in a separate file outside the hospital registry system in many countries to combat substance abuse[4,5].

Although the use of highly DAP in the emergency department (ED) is very beneficial, there are also certain drawbacks, such as dependence and abuse. Besides, the use of this group of drugs at very high doses can cause undesirable side effects. From this drug group, sedo-analgesics are often used in the presence of extremely painful conditions, epileptic seizures, and the requirement of rapid sequence intubation in the ED. However, the use of these drugs at a high dose and frequency increases the number of repeated presentations to the hospital[6]. Drug dependence originating from the ED can increase the risk of violence, workload loss, and hospital costs[5,7].

Besides, the easy access to highly DAP of drug-dependent patients in the ED and the administration of these drugs in this clinical setting can also develop a predisposition to dependence[8]. Furthermore, drug-dependent patients that are not given the drugs they ever administered often resort to violence. Thus, developing effective ED interventions for drug abuse requires a clear understanding of the characteristics of patients presenting to this healthcare setting[9].

In this study, we aimed to determine the characteristics and risk factors of drug dependence among the patients who were administered DAP in an emergency department.

2. Patients and methods

2.1. Study design

This retrospective cross-sectional study was conducted at Adiyaman University Training and Research Hospital with an average of 25 000 presentations per month. All presentations over 6 months between September 1, 2019, and March 1, 2020, for the administration of DAP were recorded.

2.2. Ethical approval

The study was initiated after the approval of the Ethics Committee of the Adiyaman University (approval number: 2019-6-1) and conducted according to STROBE (Observational studies in epidemiology) statement.

2.3. Patients

All patients over the age of 18 years who were given DAP in the ED were included in the study. Patients who do not develop dependence and do not take 3 or more drugs with incomplete medical data were excluded from the study. The presentation dates, administered drugs, and diagnoses of the patients were examined and recorded daily. Thus, the frequency of the same patient visiting the ED for the same purpose was obtained. To determine whether the administered drug was addictive, a more detailed archive search was performed for the same six-month period among the patients who were given three or more of the same drugs that could have drug dependence potential. Furthermore, all the medical data of these patients over the last eight years were obtained from hospital records and examined. During this examination, first, the department at which DAP were administered was identified, and then these patients' total number of presentations to the ED and other services of the hospital was recorded. Based on the eight-year data, the underlying causes of drug dependence, whether these patients had a chronic disease, the frequence of complaints, the diagnosis for which DAP was administered, and whether the patients had any previous dependence were determined.

2.4. Definitions

Drug dependence was defined as use of an DAP 3 or more times.

2.5. Outcome measures

The primary outcome measure was the all the used DAP, the underlying reasons to use these drugs, and the risk factors of drug dependence. The secondary outcome measures include secondary drug dependence, the department where the DAP were first used, types of doctors who preferred to use DAP.

2.6. Statistical analysis

The variables were analyzed using the Statistical Package for the Social Sciences (version 17.0 software, SPSS Inc., Chicago, Illinois, USA). Numerical variables were expressed as mean ± standard deviation (SD). Categorical variables were expressed as numbers and percentages. Distribution differences for categorical variables were evaluated using the *Chi*-squared test. Determining the best predictors that affect drug dependency was evaluated by multiple logistic regression analysis. 95% confidence interval (*CI*) was used for expressing the study data. The significant level of this study was set at $\alpha<0.05$.

3. Results

During the study period, 3 000 patients administered DAP were

screened. As a result, a total of 80 patients were included in the study (Figure 1).

Of the patients included in the study, 52 (65%) were male. The mean age of the patients was (49.9±19.6) years. DAP were determined as tramadol (*n*=57, 71.3%), diazepam (*n*=11, 13.8%), and Biperiden (*n*=12, 15%). No patient who received procedural sedation developed drug dependence. Specialist preferred to use DAP (*n*=43, 53.8%) (Table 1).

Based on the detailed histories and complaints of each patients, it was seen that the most common reason for the presentation was psychiatric disorders (29, 36.3%), and followed by malignancy (16, 20%), low back pain (10, 12.5%), abdominal pain (8, 10%), renal colic (7, 8.8%), neurological disorders (4, 5%), other (4, 5%), myalgia (1, 1.3%), and fracture-dislocation (1, 1.3%) (Table 2).

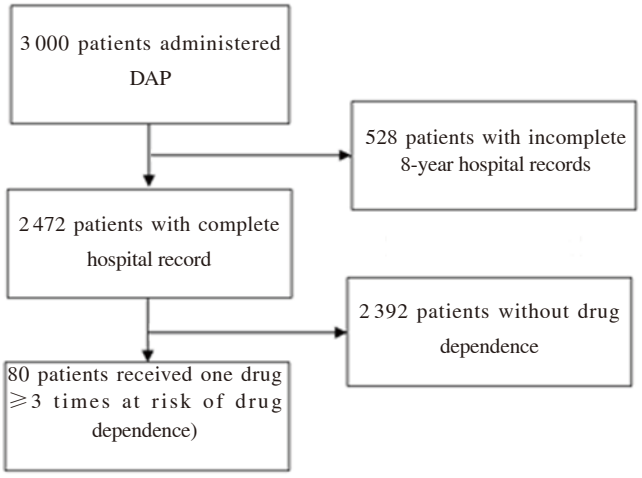

Figure 1. The study flowchart. DAP: Drugs with addictive portential.

Table 1. Gender, administered drugs, and doctors who made the presciption.

Variables	Drug dependence, *n*=80	
	n	%
Gender		
Male	52	65.0
Female	28	35.0
Administered drugs		
Tramadol	57	71.3
Diazepam	11	13.8
Midazolam	0	0
Biperidene	12	15.0
Fentanyl	0	0
Morphine	0	0
Chlorpromazine	0	0
Propofol	0	0
Rocuronium	0	0
Haloperidol	0	0
Ketamine	0	0
Doctors		
General practitioner	29	36.2
Specialist	43	53.8
Resident	8	10.0

The results shows that among patients with renal colic, all the drug dependence cases developed due to tramadol use (*n*=7, 100%). Of the patients with psychiatric complaints, 41.4% (*n*=12) became dependent on Biperiden. The rate of secondary drug dependence was 15% (*n*=12). Of the Biperiden users, 41.7% developed secondary drug dependence on diazepam. Additionally, the eight-year analysis revealed that, the most common clinical setting where the first DAP were used was the ED at a rate of 65% (*n*=52) (Table 2).

Multiple logistic regression analysis shows that renal colic and low back pain were the risk factors of drug dependence (Table 3).

Table 2. Underlying reasons of drug dependence, secondary drug dependence, and department where DAP were first prescribed.

Variables	Tramadol, *n*=57	Diazepam, *n*=11	Biperidene, *n*=12	Total, *n*=80
Underlying causes, *n* (%)				
Abdominal pain	7 (87.5)	1 (12.5)	0 (0)	8 (10.0)
Low back pain	10 (100.0)	0 (0)	0 (0)	10 (12.5)
Renal colic	7 (100.0)	0 (0)	0 (0)	7 (8.8)
Fracture-dislocation	1 (100.0)	0 (0)	0 (0)	1 (1.3)
Psychiatric disorders	9 (31.0)	8 (27.6)	12 (41.4)	29 (36.3)
Malignancy	16 (100.0)	0 (0)	0 (0)	16 (20.0)
Neurological disorders	4 (100.0)	0 (0)	0 (0)	4 (5.0)
Buerger's disease	1 (100.0)	0 (0)	0 (0)	1 (1.3)
Other	2 (50.0)	2 (50.0)	0 (0)	4 (5.0)
Secondary drug dependence				
None	52 (76.5)	10 (14.7)	6 (8.8)	68 (85.0)
Diazepam	3 (37.5)	0 (0)	5 (62.5)	8 (10.0)
Biperidene	1 (50.0)	1 (50.0)	0 (0)	2 (2.5)
Morphine	1 (50.0)	0 (0)	1 (50.0)	2 (2.5)
Department where DAP were first prescribed, *n* (%)				
Emergency	39 (75.0)	7 (13.5)	6 (11.5)	52 (65.0)
Psychiatry	7 (43.8)	4 (25.0)	5 (31.3)	16 (20.0)
Surgery	7 (100.0)	0 (0)	0 (0)	7 (8.8)
Oncology	4 (80.0)	0 (0)	1 (20.0)	5 (6.2)

DAP: Drugs with addictive portential.

Table 3. Risk factors for drug dependence.

Variables	Wald	*OR*	95% *CI*	*P*
Gender				
Female	2.193	0.700	0.436-1.122	0.139
Male (reference)	-	-	-	-
Seniority of doctors				
Specialist	3.851	1.615	1.001-2.607	0.051
Resident	0.283	1.241	0.560-2.748	0.595
General practitioner (reference)	-	-	-	-
Tramadol				
Yes	1.095	1.409	0.741-2.679	0.295
No (reference)	-	-	-	-
Diazepam				
Yes	0.038	0.921	0.400-2.119	0.846
No (reference)	-	-	-	-
Low back pain				
Yes	22.063	5.778	2.779-12.014	<0.001
No (reference)	-	-	-	-
Renal colic				
Yes	8.241	3.387	1.473-7.788	0.004
No (reference)	-	-	-	-

4. Discussion

In recent years, drug abuse among young people has been expanding. The United Nations Office on Drugs and Crime states that the non-medical use of sedatives and tranquilizers is higher among men than women. This difference between the genders may be related to these drugs being easier to procure through unrecorded means among men[10,11]. Many people admitted to obstetrics and gynecology, emergency department, oncology and surgery clinics may develop a substance use disorder due to commonly use of DAP in these departments. However, most DAP are first administered in the ED[4,6,8,11-13]. Similarly, In our study, mostly DAP (65%) were first administered in the ED.

The use of highly DAP at repeated and high doses poses a higher risk of drug dependence among patients with cancer, those undergoing surgery, and psychiatric cases[12]. Christopher *et al.*[13] reported that 65% of patients were prescribed opioids immediately after spinal surgery, and 47% continued to abuse postoperative drugs. Opiate abuse is common after spinal surgery. A recent overall analysis found that at least one in five patients experiencing cancer-related pain might be at risk of non-medical drug abuse[14]. In our study, the rate of cancer diagnosis was quite high (n=16, 20%). Considering that cancer patients may undergo very painful episodes, there is a need for further studies to investigate whether the administration of opiate analgesics is a real necessity or an indication of dependence.

In a study conducted by Benjamin *et al.*[15] to evaluate opiate prescription among different doctors, it was found that general practitioners tended to prescribe this drug more often. In another study by Baldemir *et al.*[16], it was seen that 67.9% of the doctors were hesitated when prescribing opioids, and most of them avoided prescribing these drugs. When the authors further evaluated the data, they determined that the prejudices about opioids were not related to the title or experience of doctors. In our study, the drugs with high addictive potential were preferred by specialist (53.8%). This may be due to specialist seeing more chronic, complicated cases.

DAP are mostly used in the presence of repeated chronic pain, epileptic seizures, and the requirement of procedural sedation. Chronic repetitive high-dose applications have high addictive potential[17]. In contrast, the addictive level of a single-dose administration is low. In a previous study, more than half of regular opioid users reported back pain[18]. In our study, we found that the most common reasons for referral to highly DAP were psychiatric symptoms. None of the patients that received highly DAP in the ED for procedural sedation were administered this type of drug again within six months. Opiates and sedative agents are the drugs of choice in the ED for procedural sedation and acute cases. ED was identified as the clinical setting where most DAP had been first administered. This is probably due to the patients presenting to the ED more frequently and easily in Turkey, and it shows that their drug dependence may have therefore originated from the ED. A previous study also reported that ED physicians had similar concerns[16].

Referrring to the type of preferred DAP, opiates seem to be the most commonly abused drug. In a previous study, prescriptions of opiates in 2015 were found to be three times higher compared to that of 1999[19]. In our study, tramadol was most preferred drug in the ED.

In a study on secondary drug dependence, it was reported that the risk of opiate dependence was increased among the patients using benzodiazepine[20]. In our study, we observed secondary

drug dependence mostly in the use of Biperiden and diazepam. This can be explained by the fact that physicians try to choose a different agent due to the risk of dependence or considering different diagnoses.

The issue regarding the risk factors for drug dependence remains controversial. In some studies, chronic pain (*e.g.*, neck and low back pain), anxiety, tobacco and alcohol use, history of a substance use disorder, and postoperative opiate use have been defined as the independent risk factors[21,22]. Sun *et al.*[20] stated that advanced age and male gender were risk factors for opiate abuse after surgery. In contrast, there are also studies arguing that drug dependence is more common in females[23].

Our study is a retrospective study with a small number of cases. The province in which we conducted the study is small and it is difficult to access drugs outside the medical setting. Patients who were administered the DAP for only a certain time interval (for a period of eight years) in the ED have been studied.

To sum up, most DAP are first used in the ED compared to other departments, and specialist are preferred to use additicve drugs. Tramadol is the most commonly used drugs caused drug dependence. Psychiatric disorder patients are easier to develope drug dependence. Furthermore, renal colic and low back pain patients needs more attention to avert drug dependence.

Conflict of interest statement

The authors report no conflict of interest.

Authors' contributions

E.Y., K.T., U.G., U.L., and E.A. developed the study concept; All authors contributed to the study design; Data collection were performed by E.Y.; U.G. performed the data analysis and interpretation, and drafted the manuscript under the supervision of U.G.; U.G., U.L., and K.T. provided critical revisions. All authors approved the final version of the manuscript for submission and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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