

*A Preventive Approach to the Risk of Substance Abuse in Medical  
Personnel with Migraine: A Case Report*

Abdi M<sup>1</sup>, Pourrahipi A<sup>2</sup>, Yousefi Kh<sup>2</sup>, Nouri Khaneghah Z<sup>3</sup>, Rabie Siahkali S<sup>4</sup>, Torkmandi H<sup>4\*</sup>

<sup>1</sup>Department of Emergency and Critical Care, Faculty of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran

<sup>2</sup>Department of Nursing, School of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran

<sup>3</sup>Operating Room Department, Faculty of Paramedic, Alborz University of Medical Sciences, Karaj, Iran

<sup>4</sup>Operating Room Department, Faculty of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran

**\*Corresponding Author:** Operating Room Department, Faculty of Nursing and Midwifery, Zanjan University of  
Medical Sciences, Zanjan, Iran

*Email:* hojjat.or@gmail.com

**Received:** 8 Dec 2019

**Accepted:** 11 March 2020

## Abstract

**Background:** Substance abuse as a major social and medical problem can be job-dependent.

**Objectives:** Among various occupations, medical personnel have greater access to narcotic drugs, leading to mood, behavior, and occupational disorders and ultimately death due to lack of control.

**Methods:** The present study reported a death of medical personnel with migraines owing to colleagues' inattention to substance abuse.

**Results:** The case was a 44-year-old man with 24 years of clinical experience, good social relationship, no symptoms of psychiatric disorder, an expert in the field of anesthesiology, and a popular manager among hospital colleagues. Diagnosed with migraine headaches one year ago, he worked for several treatment centers. According to some reports, he showed ataxia in some cases due to the exacerbated headache. Additionally, ataxia and drowsiness after a headache attack were not considered the cause of drug abuse so that they were always attributed to the disease. Eventually, in a shift, he had a respiratory failure and then died of the overdose or non-control of fentanyl abuse.

**Conclusion:** Medical personnel with migraine are at high risk of substance abuse in therapeutic settings. Therefore, it is suggested that periodic and intangible examinations be conducted for medical personnel, especially those with migraines in the field of substance abuse, and preventive counseling be provided.

**Keywords:** *substance abuse; medical personnel, migraine*

## Introduction

Chronic pain refers to the pain lasting for more than six months. Many people experience this state as a major cause of disability worldwide due to low back pain and arthritis, headache, and migraines [1]. These disabilities can occur in occupational, personal and social fields for individuals. Medical and paramedical disciplines are at high risk of chronic pain, especially headache and migraine as its most common type are due to high occupational stress and sleep disorders [2]. The migraine is diagnosed if

patients have a chronic headache for 10 to 15 days or more than three months, or its migraine signs remain for at least 8 days per month.

Migraine is prevalent worldwide, but it is more common in women than in men. One-year prevalence for migraine is reported by approximately 12% (6% male, 15% female) with a lifetime of 15-18%. The most common type of chronic migraine affects approximately 2% of the public and accounts for 8% of all migraine cases [3].

Various ways exist to control migraine one of which is the consumption of narcotic drugs.

Narcotic drug are widely available to medical personnel, increasing the risk of abuse, especially in those with chronic pain [4]. Fentanyl is an example of these drugs, introduced as an anesthetic drug and narcotic by Paul Johnson in 1960. At that time, fentanyl was discovered as the fastest effective opioid drug that was 50-100 times more potent than morphine and 30-50 times more potent than heroin [5], used for moderate to severe pain, cancer pain, and induction of anesthesia [6]. Since 1979, fentanyl and its analogs, which were produced and synthesized in the laboratory as a substitute for or in combination with heroin, have led to its higher unauthorized production and higher drug-related deaths [7]. Post-mortem studies of the victims indicated pulmonary edema and congestion in the individuals. Rapid death from fentanyl consumption has increased considerably [8]. The death rate from fentanyl use increased by 55 percent in New York from 2015 to 2017 [9]. Given the applicability of fentanyl in the control of various pains, the risk of its abuse is considered a serious public health challenge [10]. Despite the beneficial effects of fentanyl on anesthesia and pain relief in patients, it may be abused and cause respiratory depression, prolonged apnea, and sudden death [11,12].

Considering the availability of this drug to the medical personnel, especially the operating room and anesthesia personnel, it is more likely to be used arbitrarily among these individuals than the public. Approximately 10%-15% of hospital personnel are dependent on available drugs [4]. Among various drugs, the arbitrary use of fentanyl is more common in medical personnel [13]. The present case report was a 44-year-old male anesthesiologist with a history of migraine. He had arbitrarily used fentanyl, leading to apnea, respiratory depression, and ultimately death.

### Case report

The case reported was a 44-year-old man working in the operating room (anesthesiologist) with 24 years of experience. He was popular among his colleagues as a person with good relationships, and he was responsible, committed, trustworthy and well respected. He had reported a history of migraine since several years ago. Despite having migraine headaches, he worked in several centers. According to colleagues, he was twice allowed to

rest for his recovery due to an imbalance at work in the operating room, but he attributed the cause of his imbalance to the headache exacerbation.

However, due to his respectful personality, his imbalance at work shifts was never attributed to substance abuse, and the cause was generally attributed to migraine complications. According to the report in a work shift (night shift), he had a respiratory apnea and then died of the intravenous overdose of fentanyl.

### Discussion

A high rate of death from substance abuse in the world is reported annually. Few of them have been analyzed scientifically. Many deaths are ignored or forgotten without being subjected to scrutiny. Medical personnel with intensive work, stress, tension, and multiple insomnia are the most vulnerable personnel due to the risk of multiple risk factors for substance abuse [14]. Since opioid, benzodiazepine, and anxiolytic drugs are more widely available to medical and paramedical personnel than the public, the likelihood of their abuse increases among the medical community. Various studies have demonstrated this issue. Aura et al. (2012) reported that the rate of substance use was 8% among the public, but 6-10% among specialists and anesthetic nurses [15]. Gregory Bozimowski (2014) conducted another study to examine substance abuse in anesthesia students over 5 years from 2008 to 2012, and reported it to be 0.65% for 5-year prevalence. Among the abused substances, narcotic drugs were the most commonly used drugs (n=9) by students [16].

Bonn et al. (2013) reported chronic pain as one of the main causes of substance abuse in medical personnel [17]. Chronic pain can cause severe fatigue, frustration, and a lowered tolerance threshold. It can also lead to various psychological factors such as stress, anxiety, and depression [18]. These traumatic symptoms can impair individuals' physical, economic, social, and occupational activities. They may make the individuals so disturbed that they will be unable to attend work, university and the family environment [19, 20]. Even in the workplace, they do not have sufficient focus on performing their professional duties. Chronic pain can affect different parts of the human body. The severity of pain can range from very mild to very severe and

unbearable. Since opioid, benzodiazepine, and anxiolytic drugs are more widely available to medical and paramedical personnel than the public, the likelihood of abusing them increases in medical and scientific communities. Numerous studies have confirmed this issue [13,15,16,21, 22]. Given that the case had a history of chronic headache due to the migraine, relevant authorities and the hospital manager must have considered him at high risk of substance abuse.

Regarding the risk of substance abuse among medical personnel, especially the anesthesia group, preventive strategies are necessary. Serious complications like death can be prevented in these colleagues by developing training programs on the consequences of substance abuse, safe narcotic drug request way, proper drug transfer from the pharmacy and injection into the patient, appropriate management strategies, and holding counseling classes for pain control in personnel with chronic pain [23].

### Conclusion

Owing to medical personnel's ease of access to narcotic drugs, they are more likely to become addicted to drugs. Anesthesia personnel may be at a greater risk than other groups. Disorders like chronic pain or different headaches, including migraines, can increase the risk of abuse in this group. Periodic and irregular screening may be an appropriate strategy to prevent substance abuse among medical personnel.

### Key points:

✓Medical personnel with migraine should be considered individuals at a high risk of substance abuse.

✓Irregular drug control at hospitals is an important and appropriate way to prevent substance abuse

### Acknowledgements

We are deeply grateful to all medical personnel who assisted us in obtaining information about the reported case.

### Conflict of interest

The authors rejected any conflict of interest

### References

1. Archer KR, Seebach CL, Mathis SL, Riley III LH, Wegener ST. Early postoperative fear of movement predicts pain, disability, and physical health six months after spinal surgery for degenerative conditions. *Spine J.* 2014; 14(5): 759-67.
2. Bhattarai B, Kandel S, Adhikari N. Perception about the role of anesthesia and anesthesiologist among the paramedical staffs: Perspective from a medical college in Nepal. *Kathmandu Univ Med J (KUMJ).* 2012; 10(2):51-4.
3. Miller S, Matharu MS. Migraine is underdiagnosed and undertreated. *Practitioner.* 2014; 258(1774): 19-24.
4. Brand M, Rojas J, Fareed S, Koos E. ExecuCare: Outpatient treatment for impaired professionals. *Addictive Disorders & Their Treatment.* 2013; 12(1): 11-8.
5. Schep LJ, Knudsen K, Slaughter RJ, Vale JA, Megarbane B. The clinical toxicology of gamma-hydroxybutyrate, gamma-butyrolactone and 1, 4-butanediol. *Clin Toxicol (Phila).* 2012; 50(6): 458-70.
6. Aldington D, Jagdish S. The fentanyl 'lozenge' story: from books to battlefield. *J R Army Med Corps.* 2014; 160(2): 102-104.
7. Schug SA, Ting S. Fentanyl formulations in the management of pain: an update. *Drugs.* 2017; 77(7): 747-63.
8. Jalal H, Buchanich JM, Roberts MS, Balmert LC, Zhang K, Burke DS. Changing dynamics of the drug overdose epidemic in the United States from 1979 through 2016. *Science.* 2018; 361(6408): eaau1184.
9. Colon-Berezin C, Nolan ML, Blachman-Forshay J, Paone D. Overdose Deaths Involving Fentanyl and Fentanyl Analogs—New York City, 2000–2017. *MMWR Morb Mortal Wkly Rep.* 2019; 68(2): 37.
10. Ahn JS, Lin J, Ogawa S, et al. Transdermal buprenorphine and fentanyl patches in cancer pain: a network systematic review. *J Pain Res.* 2017; 10: 1963-72.
11. Corsi NJ, Dragovic LJ. Fatal overdoses involving carfentanil: A case series. *J Forensic Sci leg Med.* 2019; 5(3): 147.
12. Ramos-Matos CF, Lopez-Ojeda W. Fentanyl. *StatPearls [Internet]: StatPearls Publishing;* 2019.
13. Rojas JI, Jeon-Slaughter H, Brand M, Koos E. Substance abuse patterns and psychiatric

symptomatology among three healthcare provider groups evaluated in an out-patient program for impaired healthcare professionals. *J Addict Dis.* 2013; 32(1): 99-107.

14. Littlejohn P. The missing link: using emotional intelligence to reduce workplace stress and workplace violence in our nursing and other health care professions. *J Prof Nurs.* 2012; 28(6): 360-68.

15. Wright EL, McGuiness, Moneyham, Schumacher, Zwerling, Stullenbarger. Opioid abuse among nurse anesthetists and anesthesiologists. *AANA J.* 2012; 80(2): 120-28.

16. Groh DC, Rouen P. The prevalence and patterns of substance abuse among nurse anesthesia students. *AANA J.* 2014; 82(4): 277.

17. Bonn-Miller MO, Boden MT, Bucossi MM, Babson KA. Self-reported cannabis use characteristics, patterns and helpfulness among medical cannabis users. *Am J Drug Alcohol Abuse.* 2014; 40(1): 23-30.

18. Blackburn-Munro G, Blackburn-Munro R. Chronic pain, chronic stress and depression: coincidence or consequence? *J Neuroendocrinol.* 2001; 13(12): 1009-23.

19. Crook J, Milner R, Schultz IZ, Stringer B. Determinants of occupational disability following a low back injury: a critical review of the literature. *J Occup Rehabil.* 2002; 12(4): 277-95.

20. Saastamoinen P, Leino-Arjas P, Laaksonen M, Lahelma E. Socio-economic differences in the prevalence of acute, chronic and disabling chronic pain among ageing employees. *Pain.* 2005; 114(3): 364-71.

21. Iwersen-Bergmann S, Rösner P, Kühnau H, Junge M, Schmoldt A. Death after excessive propofol abuse. *Int j legal med.* 2001; 114(4-5): 248-51.

22. Kranioti EF, Mavroforou A, Mylonakis P, Michalodimitrakis M. Lethal self administration of propofol (Diprivan): a case report and review of the literature. *Forensic Sci Int.* 2007; 167(1): 56-58.

23. Neville K, Roan N. Challenges in nursing practice: Nurses' perceptions in caring for hospitalized medical-surgical patients with substance abuse/dependence. *J Nurs Adm.* 2014; 44(6): 339-46.