

Predisposing Factors for Methadone Poisoning in Children Hospitalized at Kerman Afzalipour Hospital, Iran

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Short Communication

Abstract

Background: Methadone is a synthetic opioid that has been used to relieve severe pain in addiction withdrawal. Unfortunately, due to non-standard supply and storage, the incidence of poisoning and deaths caused by this drug is increasing daily. The purpose of this study was to determine the underlying causes of methadone poisoning in children admitted to Kerman Afzalipour Hospital, Kerman University of Medical Sciences, Iran, during 2012.

Methods: This cross-sectional study was performed on 105 children diagnosed with methadone poisoning and admitted to the pediatric emergency ward at Kerman Afzalipour Hospital. The required information was recorded through interviews with parents, patient examination, and if necessary telephone calls with the parents. The data were analyzed using SPSS software.

Findings: Mean age of children was 3.9 ± 2.4 years and 59.0% of them were boys. Most parents had a high school diploma or a lower level of education. In all cases, a family member or relative, or at least one person in a party they attended was an addict. In most cases, methadone was fed to the child by mistake instead of water or other drugs. Parental substance abuse, employment status, and family income were significantly associated with methadone poisoning.

Conclusion: Training of methadone storage in individuals who need to use this drug can help to prevent accidental ingestion and poisoning of children.

Keywords: Children; Intoxication; Methadone

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Introduction

Throughout the world, more than 180 million individuals have experienced illegal drugs at least once.¹ Among them, 13.5 million individuals are dependent on opium consumption. According to the UN World Drug Report, Iran has the highest number of cases of addiction to opioid compounds. It was estimated that about 4 million Iranians regularly or occasionally consume opium in mostly smoking and respiratory forms.^{2,3} After tobacco, opium is the most commonly used drug in Iran.⁴

Poisoning with opium and its derivatives is considered dangerous and deadly and can lead to loss of consciousness, coma, apnea, and ultimately death. It is often the cause of death due to poisoning in children, and unfortunately it is one of the most common forms of poisoning in children in Iran. Annually, about 10.0% of children admitted to Loghman Hakim Hospital (the only children's hospital in Tehran, Iran) due to poisoning are diagnosed with intoxication with opium and its derivatives. Unfortunately, the incidence of these poisoning cases is increasing each year. Some reports have indicated that narcotics were the reason for half of all cases of poisoning in children and comprise up to 90.0% of deaths from poisoning in this age group in some parts of Iran.⁵

Methadone is a synthetic opioid and pure agonist, with long half-life, and very strong analgesic effect. The half-life of this substance is reported as more than 25 to 52 hours.⁵ Every milliliter of methadone syrup contains 5 mg of methadone. A dosage of 1 mg/kg of methadone can cause serious intoxication, sleep apnea, and even death. Methadone maintenance treatment (MMT) centers have started their activities in Iran since 2005. They treat opioid dependent individuals with conditions such as injection drug use, history of imprisonment, and history of repeated withdrawal.² This substance has entered homes, but its safety procedures are not met. Thus, the accidental exposure of children to methadone has caused intoxication and death. In Canada, despite safety measures such as distribution of drugs in containers that children cannot open, attaching warning labels to medication containers, pharmacist explanations regarding keeping the medication out of the reach

of children, cases of intoxication and even death have been reported due to use of this substance.⁶ However, these safety measures are not implemented in Iran. Therefore, intoxication and death caused by this substance in children is not unexpected. Unsafe storage of this substance, particularly in soda bottles, glasses or water bottles, and other medication bottles, due to its similarity in color and appearance to water, is the major cause of intoxication in children.⁷

Available information on the signs and symptoms and underlying variables of methadone poisoning is mostly related to adults and individuals with chronic addictions. Considering the effects of intoxication in children, lack of study in this area, increased cases of intoxication, and significant risks of intoxication, this study aimed to determine the clinical and epidemiological profile of cases of methadone intoxication in children.

Methods

This cross-sectional descriptive study was conducted on all children who referred to Afzalipour Hospital in Kerman, Iran, and were diagnosed with methadone intoxication. From the beginning of 2012 until the end of June 2013 (15 months), all children who were admitted to the pediatric ward of Afzalipour Hospital with the diagnosis of intoxication by methadone were enrolled in the study.

The checklist which was prepared contained items on demographic information and other information of the individuals. The required information was gathered through interviewing the parents and examining the children, and recorded in the checklist. Additional required information was collected and recorded through phone calls with the parents.

After completing the checklists, the available data were entered into the SPSS software (version 20, SPSS Inc., Chicago, IL, USA) and analyzed using descriptive statistics including frequency, mean, standard deviation (SD), minimum, maximum, median, and mode.

Results

In the present study, 105 children who were diagnosed with intoxication by methadone and admitted to the pediatric emergency ward of Afzalipour Hospital in Kerman were studied.

Among these children, 59.0% were boys and their minimum and maximum ages were 0.5 and 14, respectively, with mean age of 3.9 ± 2.4 years. About 61.0% of parents had a high school education level or diploma. About 89.0% of them were self-employed or an employee (Tables 1 and 2). More than 90.0% of children had low-income or medium income families.

Of the 105 children studied, 19 (18.1%) were intoxicated at a party due to storage of methadone at home and the host's consumption for addiction withdrawal. Moreover, 83 (79.1%) were intoxicated due to a family member's or relative's addiction, and thus, storing of methadone at home and accidental use by children.

Methadone was stored at home in three different ways; in water bottles, in medication bottles, and as pills. Only 7 individuals (6.7%) stored and consumed methadone as pills. Of the 98 other individuals, 51 (48.5%) stored methadone in water bottles, and 47 (44.8%) stored it in medication bottles. In 2 cases (1.9%), methadone was deliberately fed to children. In 50 cases (47.6%),

methadone was accidentally consumed instead of water, and in 53 cases (50.5%), it was accidentally used as medication and caused intoxication in children. The relationship between a number of the variables studied are presented in table 1.

During admission to the emergency unit, 51.0% of children were drowsy, 25.7% unconscious, and 22.9% were fully aware. The children's mean score of consciousness was 13 ± 1 on admission. Of the 105 children examined, 2 (1.9%) had seizures during the emergency admission. Other symptoms that the children presented at admission included vomiting (22.0%), cyanosis (3.8%), apnea, itching and restlessness (1.0%). Quantitative description of vital signs upon arrival is illustrated in table 2. A minimum of 1 and maximum of 51 injections of naloxone were used. Mean number of naloxone injections used was 10.3 ± 10.3 . The mean duration of hospitalization was 43 ± 4.8 hours. Moreover, 34.3% of patients were discharged after recovery and 65.7% were discharged with personal consent. There were no deaths.

Table 1. The relationship between a number of the studied variables

Variable		P
Parents' education level	The reason for storing methadone at home	0.053
	The storage method for methadone at home	0.305
	Intentional use of methadone	0.931
	Child's reason to use methadone	0.058
Parents' addiction	The reason for storing methadone at home	< 0.001
	The storage method for methadone at home	0.060
	Intentional use of methadone	0.235
	Child's reason to use methadone	0.007
	Relative's addiction	< 0.001
	Parents' occupation	0.009
	Family income	0.009
Family income	Parents' education level	0.062
	The reason for storing methadone at home	0.047
Methadone storage method at home	Child's reason to use methadone	< 0.001
	Intentional use of methadone	0.080

All P-values of less than 0.05 were considered significant.

Table 2. Quantitative description of vital signs of children intoxicated with methadone on arrival

Signs	Minimum	Maximum	Mean \pm SD	Median	Mode
Heart beats per minute	20	140	69 ± 18	96	100
The number of breaths per minute	12	100	22 ± 9	20	18
Systolic blood pressure (mmHg)	10	120	9 ± 14	90	90
The level of consciousness score	10	15	31 ± 1	14	14

SD: Standard deviation

Discussion

The results of this study showed that 59.0% of the intoxicated children were boys. The predominance of boys was not reported in some other studies.⁸ Nevertheless, in the study by Besharat et al. in Golestan, Iran, the frequency of intoxication with opium and its derivatives was higher in boys.⁹ The mean age of children who were intoxicated with methadone in Kerman was 3.9 ± 2.4 years which was lower than the study by Jabbehdari et al. (55 months).¹⁰

In most studies, the education level of parents was not investigated. The study by Besharat et al. showed that 80.0% of parents had an education level below diploma.⁹ Although in the present study the education level of the parents seemed to be higher, it was still clear that addiction and methadone use was higher among families with lower educational level. Occupation and income levels of the families were often not investigated in other studies. The majority of children intoxicated with methadone in this study belonged to families of middle and lower economic status with low-income jobs. This also reflects the necessity of considering education in low-income communities.

Moreover, 79.0% of intoxicated children had an addicted family member or first-degree relative and in all the cases methadone was stored at home. The results confirmed that methadone did not have any specific container and the addicts stored it in water bottles or medication bottles at home. Unrecognizable and unsafe containers of methadone caused its misuse by the children or their parents leading to intoxication, hospitalization, and complications for the children. It is clear that the treatment and care of these children require time, medication, and other

hospital costs. Sometimes prolonged hospitalization will lead to nosocomial infections, further complications, and even death among children. The results of this study showed that each patient was hospitalized for an average of 43 hours and an average of 10.3 naloxone injections were used for each patient. The mean hospital costs for each patient was 1564769 Rials. In similar studies, hospital costs and length of stay were not calculated.

About half of the patients who referred to the hospital due to intoxication with methadone were drowsy, a quarter of them were unconscious, and two had seizures. The most common symptoms were vomiting and cyanosis, but apnea, skin rash, and restlessness were also observed. In the study by Jabbehdari et al., loss of consciousness, vomiting, respiratory depression, apnea, seizures, and miosis were the main and common symptoms.¹⁰ These findings were consistent with those of the present study. Other studies have obtained similar results in this field.^{5,9} Although there were no cases of death in the present study, the risk of death existed regarding the symptoms especially apnea and respiratory depression.¹¹

Conclusion

Planning for the training of the consumers of methadone regarding safe packaging can prevent the intoxication of children with this substance and reduce the costs and complications.

Conflict of Interests

The Authors have no conflict of interest.

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نیمرخ اپیدمیولوژیک و بالینی مسمومیت با متادون در کودکان مراجعه کننده به بیمارستان افضلی پور کرمان، ایران

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مقاله کوتاه

چکیده

مقدمه: متادون یک اپیوئید مصنوعی است که به تازگی برای تسکین دردهای شدید ترک اعتیاد استفاده می شود. به نظر می رسد موارد مسمومیت کودکان و حتی مرگ در اثر آن روز به روز در حال افزایش می باشد. این مطالعه جهت توصیف اپیدمیولوژیک و بالینی کودکان بستری شده به علت مسمومیت با متادون در بیمارستان افضلی پور کرمان (دانشگاه علوم پزشکی کرمان) در سال ۱۳۹۱ انجام شد.

روش ها: مطالعه مقطعی حاضر بر روی ۱۰۵ کودک که مسمومیت با متادون برای آن ها تشخیص داده شده بود و در اورژانس بیمارستان افضلی پور بستری بودند، انجام گردید. اطلاعات مورد نیاز از طریق معاینه کودک، مصاحبه با والدین و در موارد لزوم تماس تلفنی با والدین، به دست آمد. در نهایت داده ها در نرم افزار SPSS مورد تجزیه و تحلیل قرار گرفت.

یافته ها: میانگین سنی کودکان $2/4 \pm 3/9$ سال بود و ۵۹/۰ درصد آنان را پسرها تشکیل دادند. سطح تحصیلات بیشتر والدین، دیپلم و یا پایین تر بود. در همه نمونه ها، یکی از اعضای خانواده یا یکی از اعضای فامیل اعتیاد داشت. در اغلب موارد، متادون اشتباهی به جای آب یا داروی دیگر به کودک خورانده شده بود. بین اعتیاد والدین، شغل و میزان درآمد با میزان مسمومیت ارتباط معنی داری مشاهده شد.

نتیجه گیری: آموزش در زمینه نحوه نگهداری متادون، می تواند از مصرف اشتباهی آن و مسمومیت اتفاقی کودکان جلوگیری کند.

واژگان کلیدی: کودکان؛ مسمومیت؛ متادون

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