

## Evaluation of Methadone Poisoning in Hospitalized Children: A Short Review

Gholamali Maamouri<sup>1</sup>, Anahita Alizadeh Ghamsari<sup>2</sup>, \*Edriss Teimouri<sup>3</sup>

<sup>1</sup>Professor of Neonatology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>2</sup>Pediatric Toxicologist, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>3</sup>Students Research Committee, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

### Abstract

Upload poisoning is one of the most dangerous and common poisoning in Iranian children. Depression of the respiratory and central nervous systems may lead to significant toxicity. Even low doses of uploads are dangerous in pediatrics under 6 years old. Methadone is the most toxic of the uploads; small doses as low as a single tablet can lead to death. According to this information we decided to evaluate methadone poisoning in hospitalized children.

**Key words:** Methadone, Naloxone, Poisoning, QTC.

### Introduction

Poisoning and deaths linked to methadone have risen since the recent trend toward the outpatient management of opioid addiction and chronic pain with methadone has led to greater availability of these drugs to children in their homes (1).

Methadone poisoning is one of the most dangerous and common poisoning and causes of presentation to emergency departments in Iranian children (2).

Although naloxone, a pure opioid antagonist, has been available for many years, there is still high mortality rate in these children (3). Even low doses of methadone are dangerous in the pediatric population under 6 years old (4).

All children who have ingested any amount of methadone have to be observed in an Emergency Department (ED) for at least 6 hours and considered for hospital admission (5).

### Discussion

Various studies demonstrated data about different features of accidental methadone poisoning in childhood.

According to Alotaibi ingestion of small amounts of methadone can lead to death. There are overlaps between toxic and fatal concentrations; careless storage is a common cause of accidental poisoning of children (6).

In Watson studies, patients who had taken long acting opioids such as methadone developed renarcosis up to 2 hours after their arrival to emergency room. Since the half life of naloxone is 60 to 90 minutes, it seems logical to observe patients for signs of recurrent toxicity for at least 2 hours (7). According to Clarke study it is difficult to decrease confounding factors, such as the

### \*Corresponding Author:

Dr. Edriss Teimouri Bakharzi, MD, Pediatric Resident, Mashhad University of Medical Sciences, Mashhad, Iran.

E-mail: [Teimourie901@mums.ac.ir](mailto:Teimourie901@mums.ac.ir).

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probable range of different opioids, co-ingestants, and adulterants that can be taken, the variety of ways by which they can be taken (orally, intravenously, subcutaneously, nasally, or by smoking), and the complex treatment regimes that are given. It is mostly difficult to determine what individual patients have taken because usually they do not know (3).

In Shania studies, higher doses of methadone in the syrup form appear to exert a similar severity of poisoning and results compared to lesser doses of that in the form of tablet (8).

There have been multiple case reports of methadone ingestions in children reporting significant toxicity from doses as low as 5 milligrams (Table. 1).

**Table1:** Multiple case reports of methadone ingestions in children

First author (Ref.)	Publication year	No. cases	Age (s)	Amount(s)	No. significant CNS/respiratory Depression	No. deaths	Reports of prolonged symptoms
Aronow(9)	1972	18	<7 years	5-40 mg	9	1	Up to 13 h
Bunchy(10)	1994	44	11mon-7 years	Up to 200 mg	20	2	24-48 h
Sesso(11)	1975	1	7 mon	10-13 mg	1	0	5.5 h
Lee(12)	1974	15	1-6 years	30-1120 mg	10	2	Seven required multiple doses of opioid antagonists
Robinson(13)	1971	3	2-10 years	Up to 50 mg	3	0	8 h
Daimio(14)	1973	4	15mon-5.5years	20-80 mg	4	4	>20 h
McCauley(15)	1969	1	21 mon	20 mg	1	0	18 h
Brooks(16)	1999	1	30 mon	Unknown	1	0	None
Schwab(17)	2001	2	8 mon-3 years	Unknown	2	0	Unknown
Farnaghi(2)	2009	31	4mon-12years	21-33mg	30	0	51hr
Say(18)	1971	1	2 years	80 mg	1	0	48-72 h
Taheri(19)	2013	385	1-90	unknown	224/137	unknown	4-240 h
Jabbehdari(20)	2012	31	<12 years	2-125mg	12	unknown	51hr

In one study in England by Eastwood and co-workers 13 cases of methadone poisoning were reported, all the children were below the age of 4 years. 5 cases (38%) were found to be dead on arrival with mean methadone concentration of (0.38 mg/L). Methadone concentrations in the survivors on arrival were (0.06) to (0.40 mg/L) (mean=0.16) (5). Sabzi and co-workers did a study on taleghani hospital emergency record of referred children during (2009) in Iran. From (6053) children entered the department (164) cases recorded as accident and poisoning. 65 cases (63.39%) were opium toxicity and 7

Cases (26.4%) were methadone toxicity (21).

**Conclusion**

Methadone poisoning is one of the most dangerous and common poisoning due to low education of patients and careless storage of methadone. In order to reduce the rate of poisoning child-resistant containers for dispensing syrup and reduction in methadone concentration should be used, however there is greater chances of survival if the child presents early to emergency department and quickly diagnosed and treatment with an opioid antagonist is started.

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