

CASE REPORT

Accidental Levothyroxine Ingestion in Children: A Report of Two Cases

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Poisoning with Levothyrox is rare in children. An overdose of levothyroxine can have serious consequences, including seizures and cardiac issues, which require close monitoring. However, some reports show that even low dosages may cause serious events such as seizures, thyroid storm, and coma. Acute ingestions of levothyroxine of less than 5 mg generally result in mild symptoms. Nevertheless, tonic-clonic seizures have been reported with a dosage of 3.6 mg of levothyroxine. In this study, we present two cases of previously healthy children who accidentally ingested thyroid hormones. The cases involved two healthy 3- and 4-year-old children ingesting levothyroxine (75µg per tablet), resulting in exposures of 1500 µg and 2250 µg. Both exhibited mild symptoms such as sinus tachycardia. No specific treatment was needed, and they fully recovered by Day 30 with regular monitoring.

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1. INTRODUCTION

Globally, unintentional traumatic injuries and poisoning are significant causes of hospitalization and disability among children [1, 2]. Surprisingly, there is a paucity of cases of levothyroxine overdose reported in the literature [3]. Accidental or intentional ingestion of thyroid hormones is a rare cause of poisoning in the pediatric population. Although there is a risk of severe symptoms, children typically manifest few or no symptoms, as demonstrated in this study. The most common cardiovascular symptoms include sinus tachycardia, atrial flutter, fibrillation, high blood pressure, or episodes of flushing [4]. Given the varied presentations of levothyroxine overdose and a lack of clear benefits of various treatment modalities, treatment of levothyroxine poisoning is challenging, and there are no specific

guidelines available [5]. Acute ingestions of levothyroxine of less than 5 mg generally result in mild symptoms. Nevertheless, tonic-clonic seizures have been reported with a dosage of 3.6 mg of levothyroxine [6]. Here, we present two cases of accidentally ingested Levothyroxine in children who took their mothers' medication used for the treatment of hypothyroidism.

2. CASE REPORTS**Case 1 presentation**

A 3 years-old boy with no specific medical history, presented with an ingestion of 20 tablets of Levothyroxine, each containing 75µg resulting in an exposition to 1500 µg 93.75 µg /kg. The clinical examination was unremarkable except for a heart rate of 120

beats per minute, a normal ECG apart from sinus tachycardia, and a temperature of 38°C, SaO₂99%, The TSH and T₄ values are reported in Table 1.

Case 2 presentation

A 4 years-old boy, with no specific medical history, presented with accidental ingestion of 30 tablets of Levothyroxine, each containing 75µg resulting in an exposition to 2250 µg 140.62 µg /kg. The clinical examination was normal, with an ECG showing sinus tachycardia at 110 beats per minute. TSH and T₄ values are reported in Table 1.

After consulting with the poison center physician, no specific treatment was required due to the mild clinical presentation in both children. Instead, they underwent cardiorespiratory monitoring with close surveillance throughout their week-long hospitalization and ECGs were conducted on Day 1, 3, 8 and 14. The outcome was favorable for both children, with a return to normal T₄ and TSH values observed by Day 30 (table 1).

Table 1. Laboratory results post-ingestion of levothyroxine cord.

Test	Reference range	Patient one				Patient two			
		Day 1	Day 8	Day 14	Day 30	Day 1	Day 8	Day 14	Day 30
Free T ₄ (pmol/L)	9-19	31.71	30.980	20.2	11.5	31.27	36.980	25.48	12
TSH m(U/L)	0.35-4.94	0.035	0.150	0.25	0.45	0.110	0.130	0.24	0.35

T₄: thyroxine; TSH: thyroid-stimulating hormone

3. DISCUSSION

Massive ingestion of levothyroxine can lead to an excessive concentration of thyroid hormone in the bloodstream, which can result in sympathetic overstimulation. Common effects include nervousness, insomnia, mild tremors, tachycardia, slight elevation in body temperature, increased blood pressure, and loose stools [4]. Severe symptoms can also occur, such as cardiac arrhythmias, respiratory failure, myocardial infarction, hemiparesis, hyperthermia, and coma [4]. Given a long 7.5-day half-life of levothyroxine, all cases with levothyroxine toxicity should be monitored closely [5].

In our study, the children exhibited mild symptoms despite the high doses ingested. However, some studies suggest that there is no direct correlation between the severity of symptoms and the dose [7].

While there is no consensus on treatment, the most crucial point is close patient monitoring. Gastrointestinal decontamination for large ingestions of levothyroxine, in particular the administration of activated charcoal, can decrease systemic absorption if instituted within 1 hour post-ingestion [8]. Cholestyramine binds to thyroxine and enhances its elimination by reducing systemic absorption.

Beta-blockers, such as propranolol, Decreases palpitations and tachycardia, to consider if patient has symptomatic tachycardia [8]. Propylthiouracil may be used to block T₄ to T₃ conversion, although its role at such a high load of levothyroxine may be limited [5].

Glucocorticoids (dexamethasone 4 mg orally) decrease the conversion of T₄ to active hormone T₃ and are recommended especially in patients with a massive levothyroxine overdose (e.g., >10,000 µg) or if the free T₄ is higher than the limit of quantification of the lab [5, 9]. Iopanoic acid and sodium ipodate reduce peripheral conversion of T₄ to T₃ but the data on their use is limited [3]. Hemodialysis has been used in severe cases, but it is probably of limited value since both T₃ and T₄ are highly protein-bound [10].

4. CONCLUSION

Our cases share similarities with other reports of massive levothyroxine ingestion. Although the signs of levothyroxine intoxication can be severe, most of the time, the symptoms are typically mild and improve favorably.

DECLARATION OF INTEREST

The authors declare that they have no known competing financial or personal relationships that could have appeared to influence to work reported in this paper.

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