

# CALM BEFORE STORM

## ACCIDENTAL THYROXINE POISONING

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FIRST YR

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A 3 year old female child was brought to the casualty with

- Accidental ingestion of eltroxin tablets 1 hour back.
- 9 mg of eltroxin(approx.)
- Mother of the child induced vomiting.  
Vomitus – No tablets seen.  
H/o pica +
- No h/o Increased precordial activity noted
- No h/o diaphoresis
- No h/o fever / flushing / tremors
- No h/o agitation / loose stools
- No h/o head ache /hyperactivity
- No h/o seizures

## PAST HISTORY:

Nil significant

## FAMILY HISTORY:

Mother is a k/c/o hypothyroidism on treatment with T.Eltroxin 100mcg for the past 6 years.

## BIRTH HISTORY:

Term/NVD /2.8kg / No NICU admission

## IMMUNIZATION HISTORY:

Immunized till 2 yrs of age

## Clinical Examination:

Child was alert, afebrile

Anaemic

No icterus, cyanosis, clubbing,  
lymphadenopathy, edema

Heart Rate – 108/min

BP- 90/60 mm of Hg

RR- 24/min

PP- ++++/+++

CRT- <2sec

Head to Toe – No Abnormality

CVS – S1,S2 heard. No murmurs

RS – B/L Air entry equal. No added sounds

P/A – Soft, non tender

No Organomegaly

CNS - Normal

# TREATMENT

- ❑ Stomach wash with saline followed by Activated charcoal was given.
- ❑ The child was asymptomatic.
- ❑ The probability of occurrence of late complications were explained to the parents and the child was admitted and kept under observation.

Time of appearance of symptoms	Symptoms	Time when the symptoms got settled
4 hours after ingestion	Tachycardia [140/min]	4 days after ingestion
9 hours after ingestion	High grade fever spikes	2 days after ingestion
24 hours after ingestion	Profuse watery diarrhea	2 days after ingestion

- ⦿ ECG was taken and it showed sinus tachycardia.
- ⦿ The child was symptomatically treated with T.Propranolol at the dose of 1mg/kg/day
- ⦿ TFT was done for this child and the values are summarised.

Hours after ingestion	FT3 [normal- 2.0-4.4 pg/ml]	FT4 [normal- 0.65-1.75ng/dl]	TSH [normal- 0.54-4.53uIU/ml]
18 hours	11.86 pg/ml	5.65 ng/dl	0.13uIU/ml
90 hours	16.18 pg/dl	6.23 ng/dl	0.01 uIU/ml
Day 8	7.82 pg/ml	3.97 ng/dl	0.11 uIU/ml
Day 30	3.14 pg/ml	0.8 ng/dl	2.54 uIU/ml

# Discussion

Levothyroxine oral time of onset of action is unknown..  
Iv 6to8hrs..peak 7to10days..so adverse effects can be  
expected till that.. Duration of action 3wks.

- ⦿ Onset of effects in 12-24hrs following ingestion of tri-iodothyronine(T3). (1)
- ⦿ Fever, vomiting, flushing, sweating, head ache, tachycardia, hypertension, seizures, desquamation of palms and soles. (1)

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1- Golightly LK, Smolinske SC, Kulig KW, et al. Clinical effects of accidental levothyroxine ingestion in children. *Am J Dis Child.* 1987;141(9):1025-7]



- ⦿ Check free T4 levels atleast 6 hrs after ingestion.(2)
- ⦿ Daily review for upto 10 days will be necessary.(2)
- ⦿ Propylthiouracil, steroids can be used in patients with moderate to severe symptoms.(2)
- ⦿ Plasmapheresis have been used in patients with cardiopulmonary disorders with severe symptoms. But it is rarely required.(3)

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- ⦿ 2 - Lehrner LM, Weir MR. Acute ingestion of thyroid hormones. *Pediatrics*. 1984;73(3):313-7. ]
  - ⦿ 3 - [Binimelis J, Bassas L, Marruecos L, Rodriguez JDomingo ML, Madoz P, et al. Massive thyroxine intoxication: evaluation of plasma extraction. *Intensive Care Med*. 1987;13:33-8.]

- ◎ American Association of Poison Control Centers' National Poison Data System of 2008 revealed that out of 9,006 unique exposures to thyroid preparations only 3 cases had major adverse outcome and there were no deaths.

*Bronstein AC, Spyker DA, Cantilena LR, Jr, et al. 2008 annual report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 26th annual report. Clin Toxicol (Phila) 2009;47(10):911–1084.*

- ⦿ No correlation between the amount of levothyroxine ingested and the onset and severity of the symptoms as well as the serum concentrations of both triiodothyronine (T3) and thyroxine (T4)

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Pardo JM. Levothyroxine poisoning. Current understanding. *Pediatrics*. 2010 Online October 20.

- ◎ Study by Golightly et al one child with massive ingestion (13mg) never developed any complications whereas ingestion of 1.8mg developed tachycardia

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Golightly LK, Smolinske SC, Kulig KW, et al. Clinical effects of accidental levothyroxine ingestion in children. *Am J Dis Child.* 1987;141(9):1025-7.

- ◎ In a study by Livotiz et al only four out of 78 children developed symptoms and T4 levels in three of these four children were 32.8, 30 and 26.4  $\mu\text{g}/\text{dl}$ , respectively

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Litovitz TL, White JD. Levothyroxine ingestion in children: an analysis of 78 cases. *Am J Emerg Med.* 1985;3(4):297–300. [[PubMed](#)]

- ◎ Pardo opines thyroxine overdose needs very close monitoring after gastrointestinal decontamination and conservative treatment like propranolol, prednisone, etc should be started as soon as the patient becomes symptomatic to avoid the development of a thyroid storm

- ◎ Large doses of LT ingestion leads to only mild toxicity
- 1. Regulatory Biochemical Mechanism-  
biologically inactive RT3 – maintains euthyroid state
- 2. RT3 – competitive inhibitor at receptor site
- 3. LT binds tightly to plasma proteins

- Hypothyroid children on LT- Risk factor for severity of acute LT poisoning
- Adults more prone to toxicity
- Co-morbidities
- Drugs



# Other drugs which can cause late onset of symptoms:

- Iron toxicity
- MAO inhibitors
- Tricyclic anti-depressants
- Hydrofluoric acid
- Acetonitrile
- Methanol

**THANK YOU**