ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Massive Thyroxine Poisoning: A Case Report and Discussion.

T Vidhyalogini*, B Shanthi, AJ Manjula Devi, and VS Kalai Selvi.

Department of Biochemistry, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India.

ABSTRACT

We describe a case of acute thyroxine poisoning who consumed a massive amount of levothyroxine and presented shortly after an ingestion of 60 tablets of 100mcg thyroxine. She was drowsy but conscious, oriented, and treated with gastric lavage and proton pump inhibitors. Common effects include nervousness, insomnia, mild tremor, tachycardia, mild elevation of body temperature, blood pressure elevation and loose stools. More serious effects have been described, but rarely, including coma, convulsions, acute psychosis and myocardial infarction .However, no fatalities have been reported after acute thyroid hormone preparation overdose. The aim of this study is to discuss the effects of acute and chronic thyroxine overdose and its complications.

Keywords: Thyroid hormone-levothyroxine poisoning-pharmacokinetics-overdose-activated charcoal, beta-blocker

Corresponding author

ISSN: 0975-8585

Case report

A 23 year old clinically depressed female patient a known case of hypothyroidism for 4 years on Levothyroxine 100mcg for the past one year presented to the emergency department (ED) of Sree Balaji Medical College, Chennai with an alleged history of consumption of 60 tablets of levothyroxine 100mcg. On examination, the patient was drowsy, conscious and oriented. Her vital signs were temperature 37.1°C, heart rate 106 beats per minute, respiratory rate 28 breaths per minute, blood pressure 130/90 mm Hg, and oxygen saturation 99% on room air. Her physical examination was normal. Gastric lavage was given. Supportive treatment given and the patient serially monitored for a period of 1 week. No serious complication occurred.

Table 1: Laboratory results post Eltroxine poisoning

PARAMETERS	FIRST DAY	SECOND DAY	DAY 4	DAY6	DAY7
	EF	PRIOR TO DISCHARGE	OUT PATIENT	OUT PATIENT	OUT PATIENT
T3	204.28ng/dl	186.87ng/dl	183.15ng/dl	188.1ng/dl	191.08ng/dl
T4	36mg/dl	36mg/dl	22mg/dl	18mg/dl	10mg/dl
TSH	1.203miu/ml	0.429	0.325miu/ml	o.415miu/ml	0.305miu/ml
FT3		6.45pg/ml			
FT4		7.15ng/dl			

DISCUSSION [1-10]

Total thyroxine and total triiodothyronine levels are shown in table 1. The initial total T4 and total T3 levels were 36mg/dl and 204.28 ng/dl, respectively (normal T4 4.5±12.5 mg/dl, normal T3 80-180 ng/dl).Twenty-four hours later (second day of poisoning counting from the zero day), total T3 levels began to decline, with a calculated half-life of 3-5 days. TotalT4 levels began to decline on the fourth day following the ingestion, with a calculated half-life of 5-7 days. Thyroid-stimulating Hormone levels were undetectable initially and remained suppressed for 10 days following the overdose. Despite the high thyroid hormones levels, the women remained almost asymptomatic. The only abnormalities were minor tremers and mild anxiety that was reported by the patient, which resolved spontaneously during her hospitalization. Her pulse rate ranged between 80 and 96/min, and the absence of tachycardia could be explained by propranolol treatment. she was discharged after 2 days and was followed in the clinic.

In literature, no fatalities have been reported after acute thyroid hormone preparation overdose. The onset of symptoms can be delayed for up to 6±11 days which correlate with pharmacokinetics, metabolism and its half-life. Serious symptoms are less frequent despite higher T4 in adults. Nevertheless serial monitoring of thyroid hormone profile is necessary. The effects of acute overdose with various preparations of thyroid hormone have been described in the literature. Serious toxicity is quite rare.

Chronic ingestion of large amounts of thyroid hormone preparations result more often in more severe symptoms, including angina pectoris, myocardial infarction, myocarditis, ventricular and atrial arrhythmias, high output heart failure, circulatory collapse, left ventricular hypertrophy, thyrotoxicosis and thyroid storm. The half-life of T4 in euthyroid individuals is 6.5±7 days, and of T3 25 hours. In our patient, the apparently prolonged half-life of T3 may be explained by continued conversion from the large store of T4. Administration of repeated doses of activated charcoal is becoming a common practice in drug overdose and it can prevent reabsorption of several drugs from the gastrointestinal system. Our case also demonstrates that repeated doses of activated charcoal are ineffective in accelerating the elimination of levothyroxine, probably due to high protein binding.

CONCLUSION

Although serious complications are not common they can appear several days later, and the patients therefore should be closely monitored. Caution is needed in case of chronic thyroxine overdose.

ISSN: 0975-8585

REFERENCES

[1] Litovitz TL, White JD. Am J Emerg Med 1985;3:297-300.
[2] Lehrner LM, Weir MR. Pediatrics 1984;73:313±17.
[3] Kulig K, Golightly LK, Rumack BH. JAMA 1985;254:2109±10.
[4] Hiassa Y, Ishida T, Aihara T, et al. Clin Cardiol 1989;12:161±3.
[5] Lewander WJ, Lacouture PG, Silva JE, Lovejoy FH. Pediatrics 1989;84:262±5.
[6] Canaris GJ, Manowitz NR, Mayor G, et al. Arch Intern Med 2000;160: 526-34.
[7] Pediatric Lexi-Drugs ONLINE. Hudson (OH): American Pharmaceutical Association; 2010.
[8] Bronstein AC, Spyker DA, Cantilena LR Jr, et al. Clin Toxicol (Phila) 2009;47:911-1084.
[9] Vale JA, Kulig K. J Toxicol Clin Toxicol 2004;42:933-43.
[10] Kreisner E, Lutzky M, Gross JL. Thyroid 2010;20: 209-12.