

Case Report

Intentional Overdose with Insulin Glargine in a Non Diabetic Patient

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Abstract

Background: Suicide attempts by injecting insulin glargine in non-diabetic patients are rare. Few cases have been reported.

Case report: A 49 year old man with a history of non treated disorder behavior invokes emergencies 3 hours after injecting 500 units of insulin glargine (lantus®). He was asymptomatic with normal blood glucose finger level (90mg/ml). The first episode of hypoglycemia (50mg/dl) occurred six hours after injection. He was then transferred to the intensive care unit.

He was treated with continuous intravenous infusion of 1700 g of carbohydrate with potassium supply by central venous line for severe hypokalemia at 2.8 meq/l. The last episode occurred 57 hours after the overdose insulin injection.

Conclusion: Prolonged hypoglycemia and hypokalemia are two fatal complications of poisoning with insulin glargine requiring close monitoring in the intensive care unit. This monitoring should be prolonged to avoid early interruption of dextrose infusion.

Keywords

- Insulin glargine
- Hypoglycemia
- Suicide attempt
- Hypokalemia

ABBREVIATIONS

H: Hour

INTRODUCTION

Suicide attempts by injecting insulin glargine in non-diabetic patients are rare. Some cases have been reported to focus on the high risk of prolonged hypoglycemia [1-9].

CASE PRESENTATION

We report a 49-year-old, non-diabetic, 100-kg male, suffering from behavioral disorder without treatment who invokes emergencies 3 hours after injecting his mother's insulin glargine (lantus®) in a suicide attempt. He injected 500 units in different sites: left arm, both thighs. The initial clinical examination revealed an asymptomatic patient with a blood glucose finger of 90 mg/dl. The laboratory tests showed hypokalemia with serum potassium 2.8 meq/l (normal: 3.5-4.8 meq/l), sodium 143 meq/l, glucose 4.2 mmol/l, urea 3.2 mmol/l and creatinine 56 µmol/l. His electrocardiogram was normal. A continuous infusion of 5% glucose started at a rate of 100 ml/h (i.e. 5g/h). Six hours after injection, the patient presented hypoglycemia (50 mg/dl) without any clinical manifestations. He was then transferred to intensive care unit. The blood glucose level was monitored hourly with glucometer (Figure 1), and serum potassium was measured twice a day (Figure 2).

He was treated with continuous intravenous infusion of 30%

dextrose at an initial rate of 125 ml/h (i.e. 37.5 g/h) (Figure 1), high caloric oral feeding and potassium supply by central venous way. The rate of glucose infusion was progressively decreased and was discontinued 67 hours after injecting insulin glargine. During the course of hospitalization, nine episodes of hypoglycemia with tremor were recorded requiring treatment with bolus of 30 g of dextrose. The last episode was detected 57 hours after the overdose insulin injection. The patient recovered and he was discharged to home 73 hours after poisoning.

DISCUSSION

Insulin glargine is the first long-acting insulin analogue used

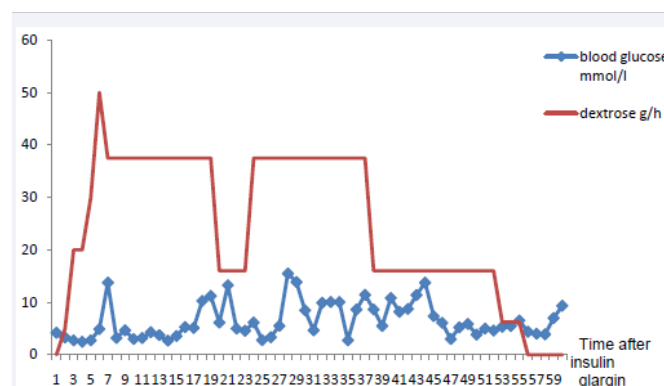


Figure 1 Evolution of finger stick glucose.

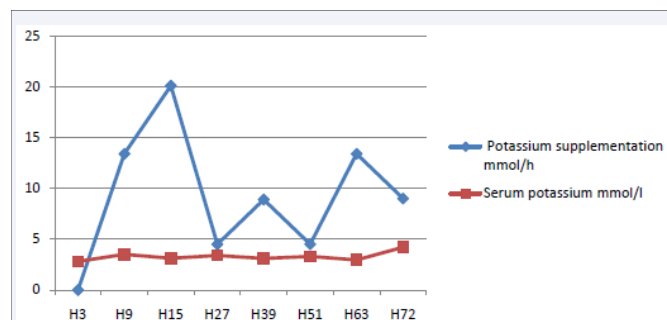


Figure 2 Serum potassium versus potassium intake intravenously.

insulin overdose. Only octreotide was tried successfully in insulin glargine [9]. Our patient was initially asymptomatic and the first episode of hypoglycemia occurred 6 hours after poisoning. He required 1700 g of dextrose administered intravenously in association with oral carbohydrate intakes during 67 hours. He developed hypoglycemia for the last time 57 h after the overdose.

Hypokalemia is the other complication associated with the use of all insulins types particularly in case of poisoning. It was reported in 5 cases with serum potassium between 3 and 3.4 meq/l [2,4,5,7,8]. Our patient had severe hypokalemia (2.8 meq/l) requiring supplementation by central line venous.

Table 1: Summary of published cases of poisoning with insulin glargine.

Age/sex (reference)	33/F ¹	21/F ²	22/F ³	31/F ⁴	37/M ⁵	51/F ⁶	12/F ⁷	39/M ⁸	56/M ⁹	55/F ¹²	46/F ¹³	49/M (our patient)
Diabetes	no	yes	yes	no	yes	yes	no	yes	yes	yes	yes	no
Consultation period (h)	5	2,5	4h	3	5	16	1-2h	-	1-1,5	20 min	15 min	5
Intentional poisoning	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	yes
Site of injection	multiple	1	2	multiple	multiple	multiple	1	multiple	1	1	1	multiple
Insulin glargine dose	300	26	300	1000	150	2700	2000	3800	3300	100	100	500
Other insulin (type)	yes (aspart)	no	yes (aspart)	no	no	no	no	yes (lispro)	no	no	no	no
Lowest blood glucose reported (mg/dl)	38	16	undetectable	43	15	23	25	50	30	134	134	45
First episode of hypoglycemia (h)	<8	2.5	4	3	5	16	2	-	1.5			6
Last episode of hypoglycemia (h)	14	53	30	106	<24	120	63	-	72	-	-	57
Duration of glucose infusion (h)	40	60	59	130	>48	120	130	108	>100	-	-	67
Serum potassium	-	3.3	-	3.4	3.3	3.3	3	-	-	-	-	2.8

for basal insulin therapy to manage diabetes. It's administered subcutaneously once daily at bedtime and released very slowly into the blood plasma over 24 h [10,11].

The major risk of poisoning is profound hypoglycemia which can induce severe neurological damage [6]. Given the long-acting nature of insulin glargine, the poisoned patients need close monitoring even in the absence of serious symptoms. According to our knowledge, eleven cases of overdose were reported in the literature (Table 1). Most of them (n=8) occurred in diabetics [2,3,5,6,8,9,12,13]. Two patients, with unintentional overdose, were observed for 17 and 24 h respectively and they didn't exhibit hypoglycemia [12,13]. The nine intentional cases [1-9] experienced signs of hypoglycemia within 1.5 to 16h after injecting subcutaneously 26 to 3800 units of insulin glargine associated to insulin aspart in two cases [1,3] and insulin lispro in one case [8]. They were treated by continuous glucose infusion for 40 to 130h and they presented the last episode of hypoglycemia over 14 to 120 h after overdose [1-9]. In association with dextrose infusion, other treatment modalities such as glucagon [14,15], octreotide [9] and incision of the injection site [5,15,16] was proposed in

CONCLUSION

Although poisoning with insulin glargine is relatively rare, it can be dangerous for the risk of deep and prolonged hypoglycemia and severe hypokalemia requiring a close monitoring and an appropriate treatment.

REFERENCES

1. Tofade TS, Liles EA. Intentional overdose with insulin glargine and insulin aspart. *Pharmacotherapy*. 2004; 24: 1412-1418.
2. Brvar M, Mozina M, Bunc M. Poisoning with insulin glargine. *Clin Toxicol (Phila)*. 2005; 43: 219-220.
3. Fromont I, Benhaim D, Ottomani A, Valéro R, Molines L, Vialettes B, et al. Prolonged glucose requirements after intentional glargine and aspart overdose. *Diabetes Metab*. 2007; 33: 390-392.
4. Ashawesh K, Kulambil RN, Murthy NP, Nizar H, Anwar A. Intentional overdose with insulin, glargine. *Am J Health Syst Pharm*. 2009; 66: 534.
5. Fuller ET, Miller MA, Kaylor DW, Janke C. Lantus overdose: case presentation and management options. *J Emerg Med*. 2007; 36: 26-29.

6. Lu M, Inboriboon PC. Lantus insulin overdose: a case report. *J Emerg Med.* 2011; 41: 374-377.
7. Kumar A, Hayes CE, Iwashyna JS, et al. Management of intentional overdose of insulin glargine. *Endocrinol Nutr.* 2012; 59: 570-572.
8. Mork TA, Killeen CT, Patel NK, Dohnal JM, Karydes HC, Leikin JB. Massive insulin overdose managed by monitoring daily insulin levels. *Am J Ther.* 2011; 18: 162-166.
9. Groth CM, Banson RE. Octreotide for the treatment of hypoglycemia after insulin glargine overdose. *J Emerg Med.* 2013; 45: 194-198.
10. Levien TL, Baker DE, White JR, Campbell RK. Insulin glargine: a new basal insulin. *Ann Pharmacother.* 2002; 36: 1019-1027.
11. Wang F, Carabino JM, Vergara CM. Insulin Glargine: A systematic review of a long-acting insulin analogue. *Clin Ther.* 2003; 25: 1541-1577.
12. Kuhn B, Cantrell L. Unintentional overdose of insulin glargine. *Am J Health-Syst Pharm.* 2008; 65: 508.
13. Thornton S, Gutovitz S. Intravenous overdose of insulin glargine without prolonged hypoglycemic effects. *J Emerg Med.* 2012; 43: 435-437.
14. White M, Zacharin MR, Werther GA, Cameron FJ. Intravenous glucagon in a deliberate insulin overdose in an adolescent with type 1 diabetes mellitus. *Pediatric Diabetes.* 2016; 17: 66-69.
15. Roberge RJ, Martin TG, Delbridge TR. Intentional massive insulin overdose: recognition and management. *Ann Emerg Med.* 1993; 22: 228-234.
16. Campbell IW. Suicidal insulin overdose managed by excision of insulin injection site. *BMJ.* 1982; 285:408-409.

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