Management of Adverse Effects from High-Dose Insulin Therapy in Calcium Channel Blocker/Beta-blocker Overdose: An Observational Study

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Background

- CCB and BB toxicities are associated with a high risk of mortality
- High-dose insulin (HDI) infusion added to standard vasopressors lead to improved outcomes
- The adverse effects of HDI and its supportive care remain incompletely characterized by extant clinical study data

Objective

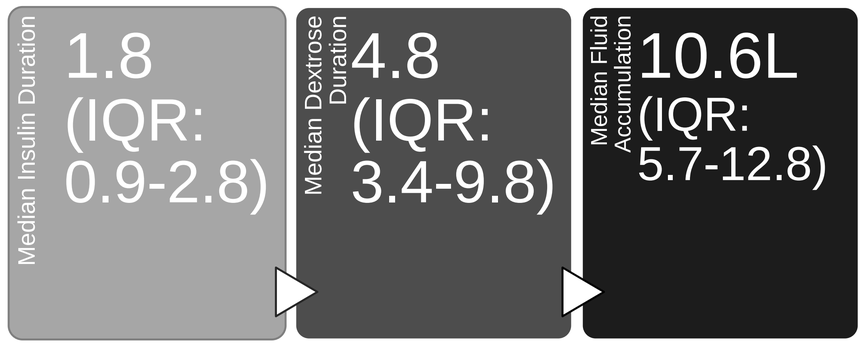
- Describe the adverse effects associated with HDI and supportive dextrose infusion

Methods

- Retrospective chart reviews of patients with that received high-dose insulin
- Patients needed to have suspected CCB/BB overdose
- Patient characteristics we deemed relevant to dosing requirements were collected. Total fluid accumulation was considered the primary outcome of interest

Results

Patient Number	Age	ccb/bb	Diabetes	Max Insulin Rate (u/kg/hr)	# of Hypoglycemia Incidences	Dextrose used	Duration of Dextrose Infusion (days)	Hypokalemia	Lowest Potassium Value (mEq/L)	Total Fluid Accumulation (L)	ECMO	CRRT	Length of Stay (days)	Mortality
1	42	Verapamil	Y	1.5	0	D10	0.75	2	2.1	2.9	VA	Y	3	Y
2	36	Amlodipine	N	12	7	D20 D25 D50	12.5	0	N/A	-7.6	N	Y	41	N
3	57	Atenolol	N	11	1	D10 D20	5	17	1.4	12.7	VA	Y	47	Y
4	36	Propranolol	N	15	20	D10 D20	4.5	6	2.6	8.4	VA	N	56	N
5	44	Verapamil	N	20	0	D20	11	2	2.5	12.8	N	Y	1	Y
6	35	Verapamil	N	10	0	D10 D50	6	1	2.4	11.4	N	Y	14	N
7	50	Verapamil	N	24	1	D10 D20	0.33	2	2.9	12.8	N	Y	0.5	Y
8	48	Verapamil	Y	4	6	D10 D20	3.25	2	2.6	21.9	N	Y	42	N
9	44	Verapamil	N	10	8	D10 D20 D50	4	7	2.8	9.8	N	Y	9	N
10	48	Unknown	Y	1	0	D10	22	3	2.6	4.8	VA	Y	5.5	Y



Conclusions

- Most patients will experience at least one side effect as a result of HDI+dextrose infusion
- HDI treatment for CCB/BB therapy places patients at high risk of fluid overload
- Insulin resistance may affect the maximum rate of insulin infusion

Implications

- Further studies should investigate optimal HDI+dextrose treatment approaches as they relate to fluid accumulation
- The effects of insulin resistance in HDI recipients warrants further exploration

References

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Disclosures

- None