INCIDENCE AND OUTCOMES OF ADULT CARDIAC ARREST ASSOCIATED WITH TOXIC EXPOSURE TREATED WITH THERAPEUTIC HYPOTHERMIA (ToxiCool)

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BACKGROUND

- Therapeutic hypothermia (TH) improves neurologic recovery in cardiac arrest survivors.
- The incidence and outcome of patients who undergo TH after a toxin-induced cardiac arrest is unknown.

OBJECTIVE

To describe the characteristics and outcomes of patients who suffer cardiac arrest due to a toxic exposure and are treated with TH.

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METHODS

- **Setting:** Single urban 874-bed academic medical center
- **Design:** Retrospective review of a postcardiac arrest QI database from Nov 2007–Feb 2013.
- **Definition of toxin-induced arrest:** Exposure to a xenobiotic that directly and acutely caused the patient's arrest.
- Database and medical records were systematically reviewed for 49 variables including demographics, initial rhythm, survival, neurologic outcome via Cerebral Performance Categories (CPC) Scale, and evidence to confirm ingestion (drug screens, autopsy, etc).
- Toxic vs. non-toxic determined by consensus of 2 out of 3 investigators.

STATISTICAL METHODS

Proportion testing via Fisher's exact test.

RESULTS

	Toxic	Non-toxic	p-value
Total arrests	48	341	
Age range (years)	18–77	19–94	
Mean age ± SD (years)	47 ± 13.6	59 ± 19.1	<0.001
Male	29 (60%)	217 (64%)	0.75
Out-of-hospital arrest	43 (90%)	328 (96%)	1.00
Bystander CPR	21 (44%)	212 (62%)	0.03
Initial shockable rhythm	16 (33%)	215 (63%)	<0.001
Survival	20 (42%)	152 (45%)	0.76
High functioning survivors (CPC 1, 2)	17 (35%)	139 (41%)	0.53

- n = 389 patients
- 48 of 389 (12%) were deemed toxic arrests
- Characteristics of patients suffering toxic arrests:
  - Younger
  - Less likely to have an initial shockable rhythm
  - Less likely to receive bystander CPR
- Most common xenobiotics:
  - Cocaine (n=16, 33%)
  - Benzodiazepines (n=13, 27%)
  - Opioids (n=9, 19%)
- Within the toxic subset, a higher proportion of survivors had an initial shockable rhythm (11/16) vs. non-survivors (9/31) (p=0.01).

LIMITATIONS

- Accuracy of assigning causality
- Incomplete confirmation of exposures
- Relatively small study population
- CPC scores extrapolated from records
- Confounding co-morbid conditions.

CONCLUSIONS

- **Toxin-associated arrests accounted for a significant proportion of database patients.**
- **Overall survival and neurologic status for toxic vs. non-toxic arrests were similar.**
- **Initial cardiac rhythm may be an outcome predictor.**

FUTURE IMPLICATIONS

Larger studies are needed to elucidate the optimal role for TH in toxin-induced cardiac arrest.

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