

Assessment of phlebitis and infiltrations following standard versus high concentration amiodarone boluses in hospitalized adult patients without central venous access

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Background

- Administration of intravenous (IV) amiodarone is associated with phlebitis and infiltrations, with the incidence ranging from 13.9% to 85%.¹⁻⁴
 - The proposed mechanism is related to formation of precipitants in the vein surrounding infusion site and is impacted by many factors, including low pH and high concentration as well as administration via a peripheral venous catheter (PVC).¹
 - The manufacturer of amiodarone recommends administration via central venous catheter (CVC) with an in-line filter to decrease risk of phlebitis and infiltration. If a peripheral catheter is used, the recommended concentration is $\leq 2\text{mg/mL}$.⁵
- 2017 IV fluid shortage directly impacted the supply of dextrose 5% in water (D5W) available for compounding amiodarone bolus doses. At Billings Clinic:
 - Clinically stable patients received amiodarone bolus from large volume continuous infusion product
 - Unstable patients received standard amiodarone bolus dose

Purpose

- Determine the effect of different concentrations of IV amiodarone boluses on the incidence of phlebitis and infiltrations in hospitalized adult subjects with PVCs

Methods

- Single-center, retrospective, observational study
- Study groups: 150 mg amiodarone bolus given over 10 minutes
 - Standard concentration (SC): 150 mg/3 mL D5W, total volume 103 mL, concentration 1.45 mg/mL
 - Separate IV piggyback
 - High concentration (HC): 900 mg/500 mL D5W, total volume 86 mL, concentration 1.74 mg/mL
 - From large volume IV infusion bag

Inclusion Criteria	Exclusion Criteria
Age ≥ 18 years	Amiodarone administration via CVC
Admitted between August 2017 and March 2018	Pregnant
Administered ≥ 1 IV amiodarone bolus \pm continuous infusion via PVC	Breastfeeding

Primary Outcome

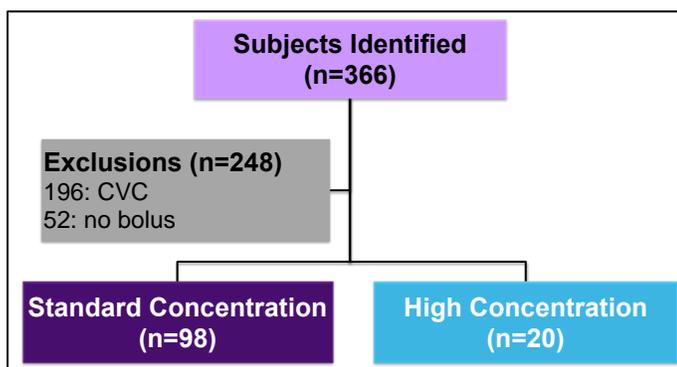
- Incidence of phlebitis and infiltrations in patients receiving IV amiodarone bolus via PVC

Secondary Outcomes

- Grade of phlebitis or infiltration
- Time to phlebitis or infiltration onset (hours)
- Total duration of amiodarone administration (hours)
- Total amiodarone dose (mg)

Results

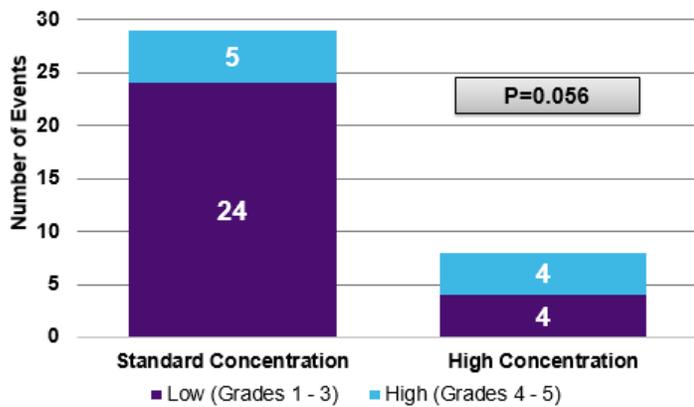
Flow Diagram



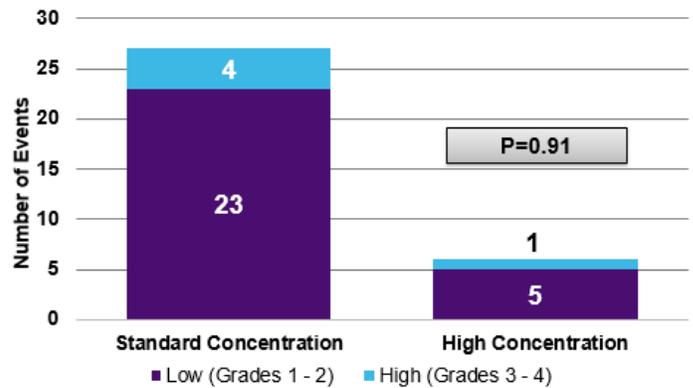
Primary Outcome

Characteristic, n (%)	All Subjects (n=118)	SC (n=98)	HC (n=20)	P Value
Phlebitis	37 (31.4%)	29 (29.6%)	8 (40%)	0.36
Infiltration	33 (28%)	27 (27.6%)	6 (30%)	0.82
Phlebitis and Infiltration	29 (24.5%)	23 (23.5%)	6 (30%)	-

Severity of Phlebitis



Severity of Infiltrations



Time to Onset

Characteristic, mean ± SD	All Subjects	SC	HC	P Value
PHLEBITIS	n=37	n=29	n=8	
Time to Onset (hours)	23.8 ± 16.7	22.8 ± 14.8	27.5 ± 23.4	0.49
INFILTRATION	n=33	n=27	n=6	
Time to Onset (hours)	25.5 ± 15.8	25.7 ± 13.7	24.4 ± 24.9	0.86

Total Duration & Dose

Characteristic, mean ± SD	All Subjects (n=118)	SC (n=98)	HC (n=20)	P Value
Duration of Therapy (hours)	29.9 ± 30.6	31.3 ± 32.2	22.9 ± 20.7	0.27
Total Dose (mg)	1225 ± 941	1244 ± 982	1132 ± 720	0.63

Discussion

- No significant difference in the incidence of phlebitis or infiltrations between groups
- In patients who developed phlebitis:
 - Outcome was more likely to be severe in the high vs. standard concentration
 - Greater incidence of low grade severity in the standard vs. high concentration
- No difference in severity of infiltrations between groups
- Mean time to onset of the adverse events was comparable between groups
- Similar mean duration of amiodarone therapy
- Similar average total amiodarone dose

Limitations

- Small sample size in the high concentration amiodarone bolus group
- Many factors can affect phlebitis and infiltrations:
 - Other irritant or vesicant medications
 - Size of IV line
 - Duration of therapy

Conclusion

- Standard and high concentration amiodarone boluses had similar rates of phlebitis and infiltrations.
 - If phlebitis occurred in high concentration group, it was more likely to be a severe grade than in the standard concentration group.
 - Phlebitis may be a predictor of future infiltration

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