

Blood Pressure Effects of Labetalol in Sympathomimetic-associated Intracerebral Hemorrhage: A Case Series

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INTRODUCTION and QUESTION

Both sympathomimetic drugs and hypertension have been associated with poorer outcomes in intracerebral hemorrhage (ICH).

Use of beta-blockers in sympathomimetic-associated cardiac events is controversial due to concern for unopposed alpha effect. Very little data exist regarding this concern for sympathomimetic-associated neurologic events.

Research Question: What is the effect of beta-blockers when used as initial management of hypertension in the setting of sympathomimetic-associated ICH?

METHODS

We performed a retrospective study of primary ICH occurring in 2009-2011 at our large academic center.

Cases were identified by ICD-9 code and verified by physician review. Demographic data, vital signs, antihypertensive treatment, and imaging characteristics were recorded.

Medical record review included history of sympathomimetic use within 24 hours of presentation and results of urine drug screens (UDS).

Cases associated with sympathomimetic drugs were screened for initial antihypertensive treatment with beta-blockers.

Detailed chart review of selected cases was performed for serial vital signs, treatment time, and medication doses.

RESULTS

We identified 424 patients with primary ICH in 2009-2011. The median GCS for this cohort was 14 (10, 15) and median ICH volume was 12.6 mL (3.9, 35.0).

Median systolic blood pressure (SBP) was 173 (152, 206) and diastolic blood pressure (DBP) was 94 (80, 110).

Of the 424 patients, eight (1.9%) had reported history of recent sympathomimetic use or UDS positive for cocaine or amphetamines/methamphetamine. One patient with amphetamine-positive UDS was excluded due to prescribed Adderall.

Of the seven remaining patients, the median GCS was 7 (3, 12) and median ICH volume was 35 mL (11.0, 55.3). Median SBP was 206 mmHg (157, 236) and DBP 121 mmHg (109, 133).

Four of these patients received beta-blockers as initial blood pressure management (see table and graphs).

SUMMARY, IMPLICATIONS, AND FUTURE DIRECTIONS

Discussion: In this case series of four patients, use of labetalol as initial treatment for severe hypertension in the setting of sympathomimetic-associated ICH appears to be ineffective. In some instances, blood pressures increased after administration of labetalol. This supports a concern for unopposed alpha effect when beta-blockers are used in the hyperacute phase.

Conclusion: These exploratory data suggest the need for further study of outcome data following beta blockade in sympathomimetic-associated ICH.

UDS (+) Substance	Case 1- Cocaine	Case 2- Cocaine	Case 3- Cocaine	Case 4- Meth/Amphetamine
Age (years), Sex	59, Female	37, Male	49, Female	55, Male
ICH Location, Volume	Lobar with IVH, 55.3 mL	Deep with IVH, 11.0 mL	Deep with IVH, 35.3 mL	Brainstem with IVH, 10.5 mL
Home Beta-Blocker	Metoprolol	Carvedilol	None	None
Pre-treatment BP #1 (HR)	220/110 (116)	221/151 (76)	242/102 (54)	203/160 (111)
Treatment #1	Labetalol 20 mg IV	Labetalol 20 mg IV	Labetalol 20 mg IV	Labetalol 10 mg IV
Time from treatment to BP measurement	22 minutes	11 minutes	9 minutes	5 minutes
Post-treatment BP #1 (HR)	206/120 (89)	233/132 (83)	190/96 (52)	209/153 (113)
Pre-treatment BP #2 (HR)		195/126 (78)	190/96 (52)	182/132 (107)
Treatment #2	Changed to nicardipine	Labetalol 40 mg IV	Labetalol 40 mg IV	Labetalol 10 mg IV
Time from treatment to BP measurement		1 minute, [10 minutes]	3 minutes	5 minutes
Post-treatment BP #2 (HR)		226/137 (79), [207/123]	181/108 (52)	206/138 (111)

Urine drug screen (UDS), Intraventricular Hemorrhage (IVH), Blood Pressure (BP), Heart Rate (HR), Intravenously (IV)

