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Impact of Preadmission Beta-blocker Use on Cardiac Abnormalities and In-hospital Mortality in Patients with Aneurysmal Subarachnoid Hemorrhage

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Introduction

Various cardiac abnormalities, including dysrhythmias, left ventricular (LV) dysfunction, and myocardial injury, are commonly seen after subarachnoid hemorrhage (SAH). In patients taking a beta-blocker (BB) chronically, the medication is generally discontinued after hospitalization due to the concern of compromising cerebral perfusion. We hypothesized that sudden BB discontinuation might inadvertently lead to an increased incidence of composite cardiac abnormalities and higher in-hospital mortality in patients presenting with non-traumatic SAH.

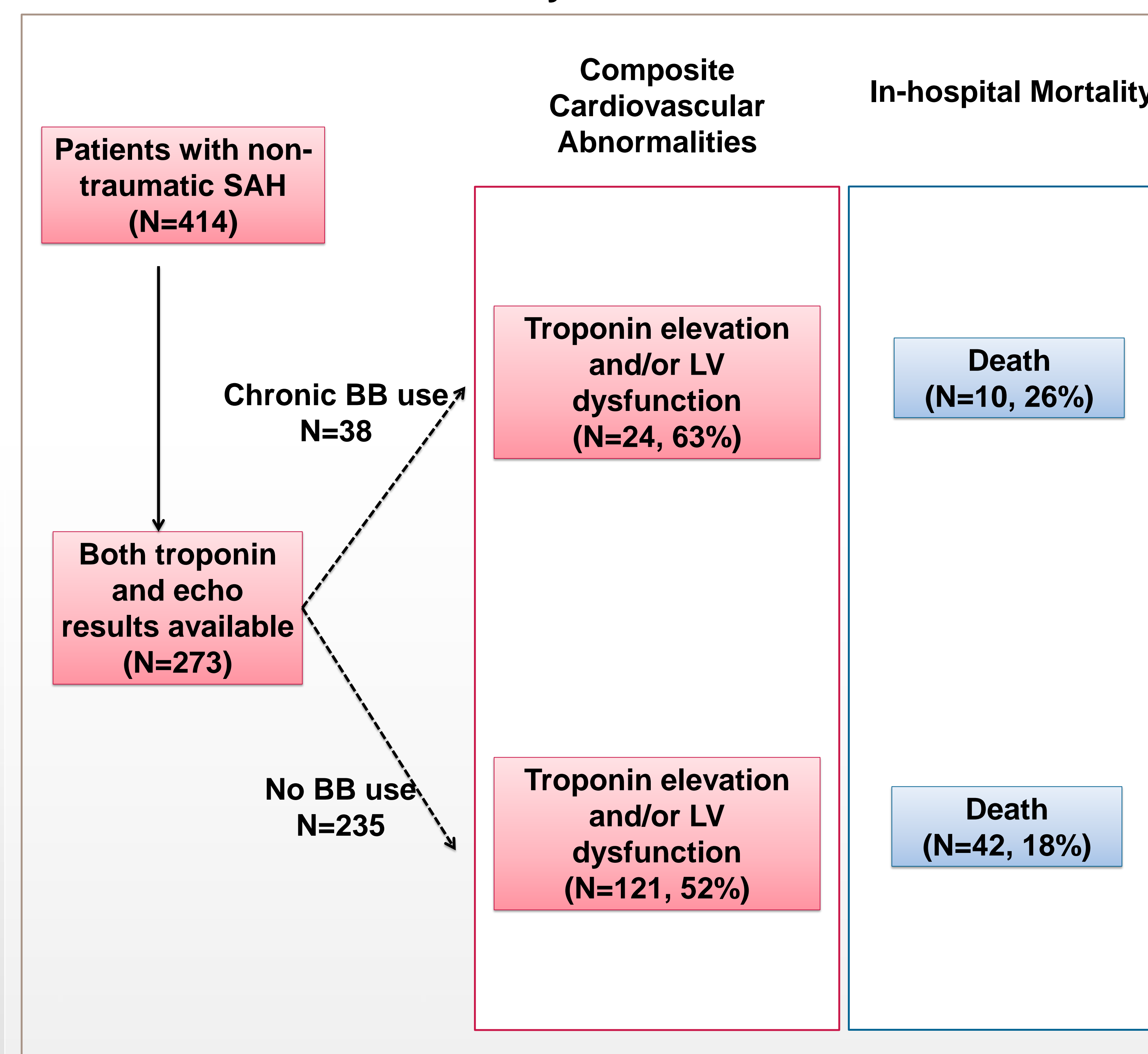
Methods

This is a single-center retrospective study of patients presenting to Thomas Jefferson University Hospital and Jefferson Hospital for Neuroscience with ruptured aneurysmal SAH between January 2009 and December 2010. Those with and without preadmission BB use were compared with respect to the composite cardiac abnormalities (troponin elevation and/or LV dysfunction) and in-hospital mortality. Troponin elevation and LV dysfunction were defined as troponin I ≥ 0.05 mcg/L, and LV ejection fraction ≤ 0.4 , respectively. Variables with $p < 0.10$ in a univariate analysis were included in a multivariable logistic regression model to determine the effect of BB discontinuation on the clinical outcomes.

Results

Of 414 patients presenting with aneurysmal SAH, 55 (13%) patients were chronic BB users. In 273 patients with both troponin and echo results, the composite cardiac abnormalities occurred in 145 patients (53%). Preadmission BB use was not associated with the composite cardiac abnormalities in the multivariable analysis ($p=0.51$). **(Table 1)** Fifty-two out of 273 (19%) patients died during the index hospitalization. Troponin elevation, but neither LV dysfunction nor outpatient BB use, was independently associated with increased in-hospital mortality ($p=0.01$). **(Table 2)**

Study overview



Results

	OR for composite cardiac outcome	95% CI	p-value*
Hunt-Hess 1-3 vs 4,5	3.9	(2.2- 6.7)	<0.001
Hypertension	1.7	(0.97-2.9)	0.07
Outpatient BB use	1.3	(0.6-2.8)	0.51

Table 1. A multivariable analysis for the composite cardiac abnormalities. A p value < 0.05 is statistically significant. OR=odds ratio, CI=confidence interval.

	OR for in-hospital mortality	95% CI	p-value*
Hunt-Hess 1-3 vs 4,5	15.2	(6.2-37.4)	<0.001
Coronary artery disease	3.9	(1.2-13.3)	0.03
Outpatient BB use	1.4	(0.5-4.1)	0.56
Abnormal Troponin	3.3	(1.3-8.5)	0.01
Abnormal LV function	2.1	(0.9-5.2)	0.1

Table 2. A multivariable analysis for in-hospital mortality. A p value < 0.05 is statistically significant.

Conclusions

1. Preadmission BB use and its discontinuation was not associated with the composite cardiac abnormalities or in-hospital mortality.
2. Sudden BB discontinuation after SAH does not appear to be associated with adverse cardiovascular outcomes.
3. Elevated troponin was independently associated with increased in-hospital mortality.