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Background

Acute pericarditis is the most common presentation of pericardial diseases. Although generally considered to have a benign prognosis, recurrences, constriction, and tamponade can occur.

Hypothesis

Clinical characteristics of patients with pericarditis may help predict adverse outcomes.

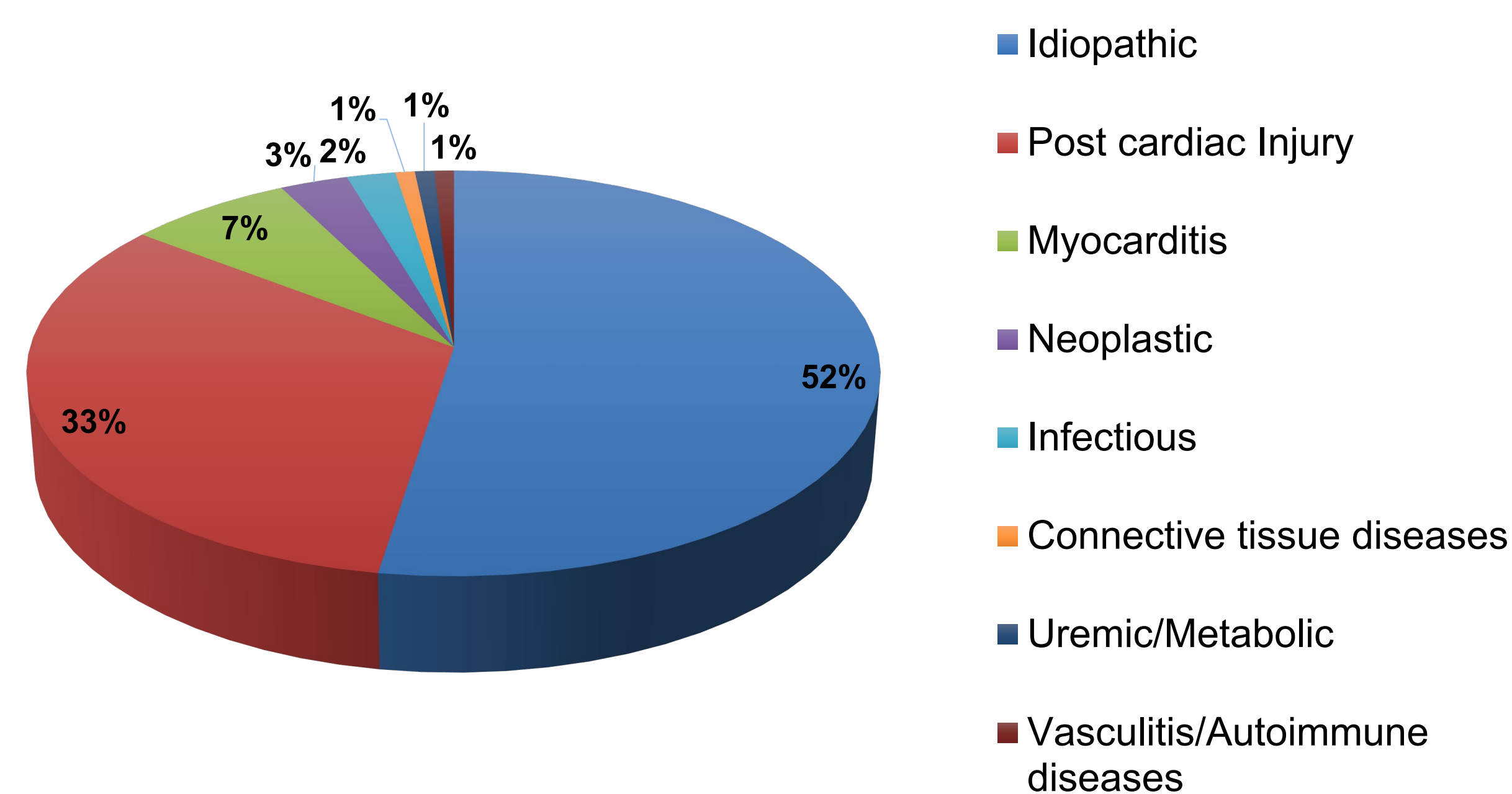
Methods

We performed an informatics-based search engine using International Statistical Classification of Diseases codes related to pericardial disease and then extracted patient-level data from the electronic health record, including only those meeting the European Society of Cardiology criteria for acute pericarditis. Presence of any of the following to constitute meeting a composite endpoint of adverse outcomes ("composite outcome"): failure of treatment, recurrences, cardiac tamponade, and constrictive pericarditis. Odds ratio (OR) and 95% confidence interval are reported.

Results

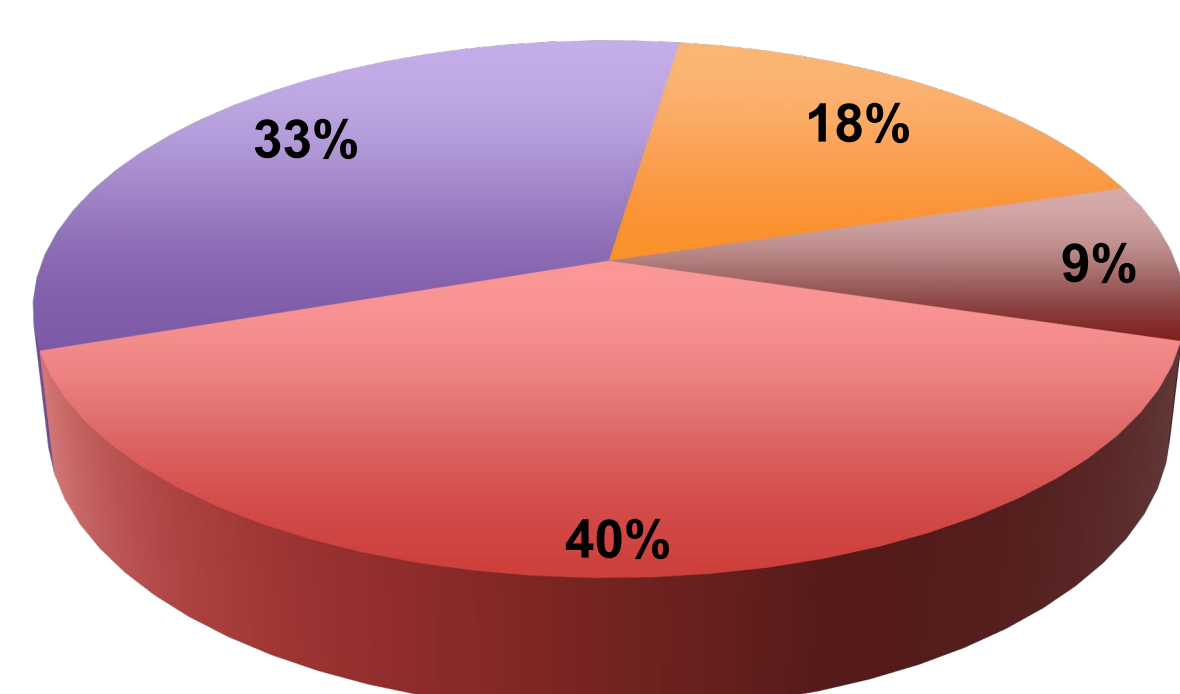
We identified 240 patients, (56% males) with a median age of 51 [34-62] years. Acute pericarditis was considered idiopathic in 126 cases (53%), related to cardiac injury in 79 cases (33%), or due to other causes in 35 cases (14%). The median follow-up time was 179 [20-450] days. Seventy-five patients (31%) experienced at least one adverse outcome. Troponin I measurements were available for 167 patients, whereas C-reactive protein and erythrocyte sedimentation rate for 72 and for 61 subjects respectively.

Etiology of acute pericarditis



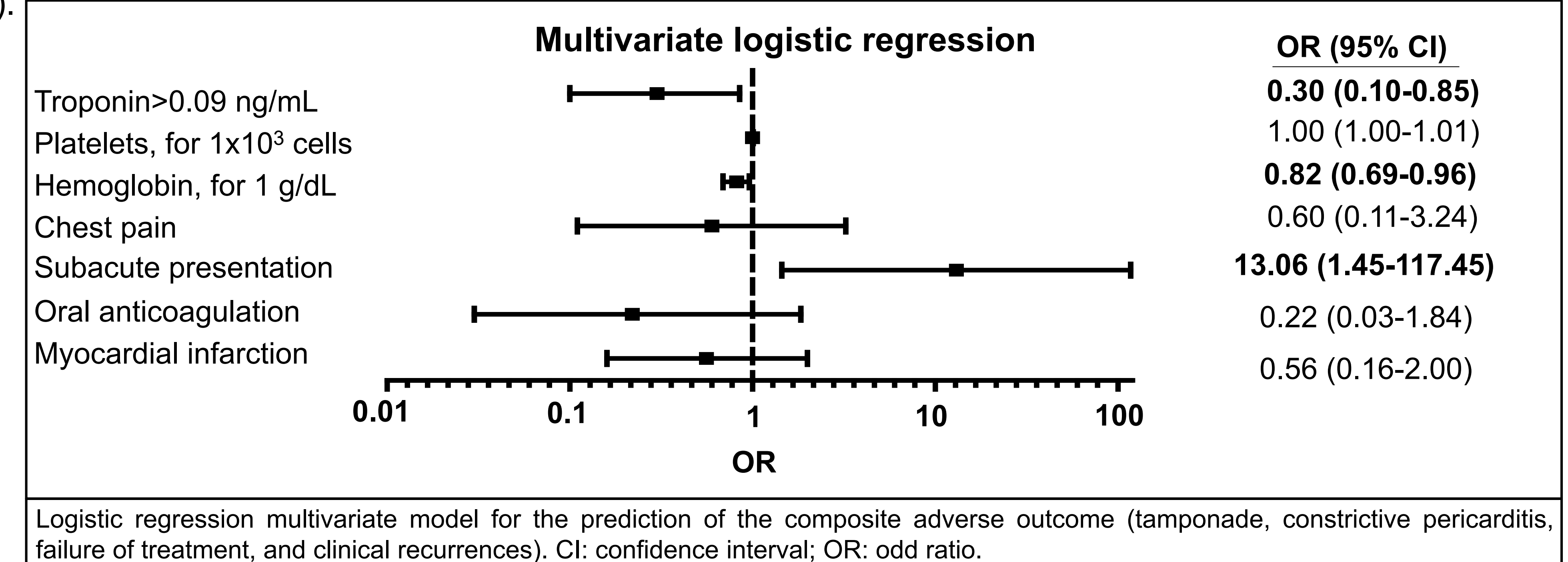
Composite outcome

■ Recurrent pericarditis
■ Cardiac tamponade
■ Failure of treatment
■ Constrictive pericarditis



Baseline characteristics	
	Overall cohort (n=240)
Demographic Characteristics	
Male sex	135 (56)
Age, y	51 [34-62]
Race	
Caucasian	121 (50.4)
Black or African-American	100 (41.7)
Other	19 (7.9)
BMI, kg/m ²	28 [24-32]
Medical History	
Autoimmune diseases	24 (10.0)
Tuberculosis	2 (0.8)
Chest radiation	8 (3.3)
Neoplastic diseases	30 (12.5)
Severe chronic kidney disease	44 (18.4)
Chest trauma	4 (1.7)
Recent cardiac procedure	
Percutaneous coronary intervention	7 (2.9)
Pacemaker/cardiac ablation	24 (10.0)
Cardiac surgery	19 (7.9)
Therapies	
Immunosuppression	15 (6.3)
High dose corticosteroids	9 (3.8)
Oral anticoagulation	27 (11.3)
Etiology	
Idiopathic	126 (52.5)
Post-cardiac injury	79 (32.9)
Other	35 (14.5)
Clinical Presentation	
Fever	21 (8.9)
Subacute presentation	12 (5.1)
Severe pericardial effusion	49 (20.6)
Heart failure	43 (18.1)
Chest pain	220 (93.2)
Cardiac Exam	
Pericardial rub	43 (18.5)
Pulsus paradoxus	10 (4.3)
Kussmaul sign	4 (1.7)
EKG	
PR depression	70 (30.6)
ST elevation	104 (45.4)
T wave inversion	57 (24.9)
Laboratory	
WBC, n x10 ³ /mL	9.4 [6.7-12.3]
CRP, mg/L	10.0 [1.6-18.6]
ESR, mm/h	52 [23-88]
Troponin>0.09 ng/mL	52 (31.1)
Treatment at Presentation	
NSAIDs	169 (70.7)
Colchicine	152 (63.6)
Glucocorticoids	29 (12.2)
Surgical procedure	
Pericardiectomy	8 (3.3)
Pericardial window	7 (2.9)
Pericardiocentesis	27 (11.3)
Adverse Outcomes	
Failure of treatment	17 (7.2)
Recurrent pericarditis	38 (15.8)
Cardiac tamponade	31 (13.0)
Constrictive pericarditis	9 (3.8)
Composite outcome	75 (31.3)
Rehospitalization for any cause	90 (37.7)
Death	9 (3.8)

Subacute pericarditis (>14 days) was an independent predictor of adverse outcomes (OR 15.5 [1.8-137.0], p=0.014). In comparison to patients with cardiac injury, those with idiopathic pericarditis were younger (48 [34-58] vs 61 [50-71] years, p<0.001), and yet were associated with a higher risk to have abnormal troponin I levels (>0.09 ng/ml)(10 [8%] vs 25 [32%]; OR 0.06 [0.02-0.15], p<0.001) yet associated a higher risk of treatment failure (10% vs 2%, OR 4.45 [0.98-20.29], p=0.037) and of combined risk of treatment failure and recurrence (26% vs 13%, OR 2.44 [1.13-5.30], p=0.021).



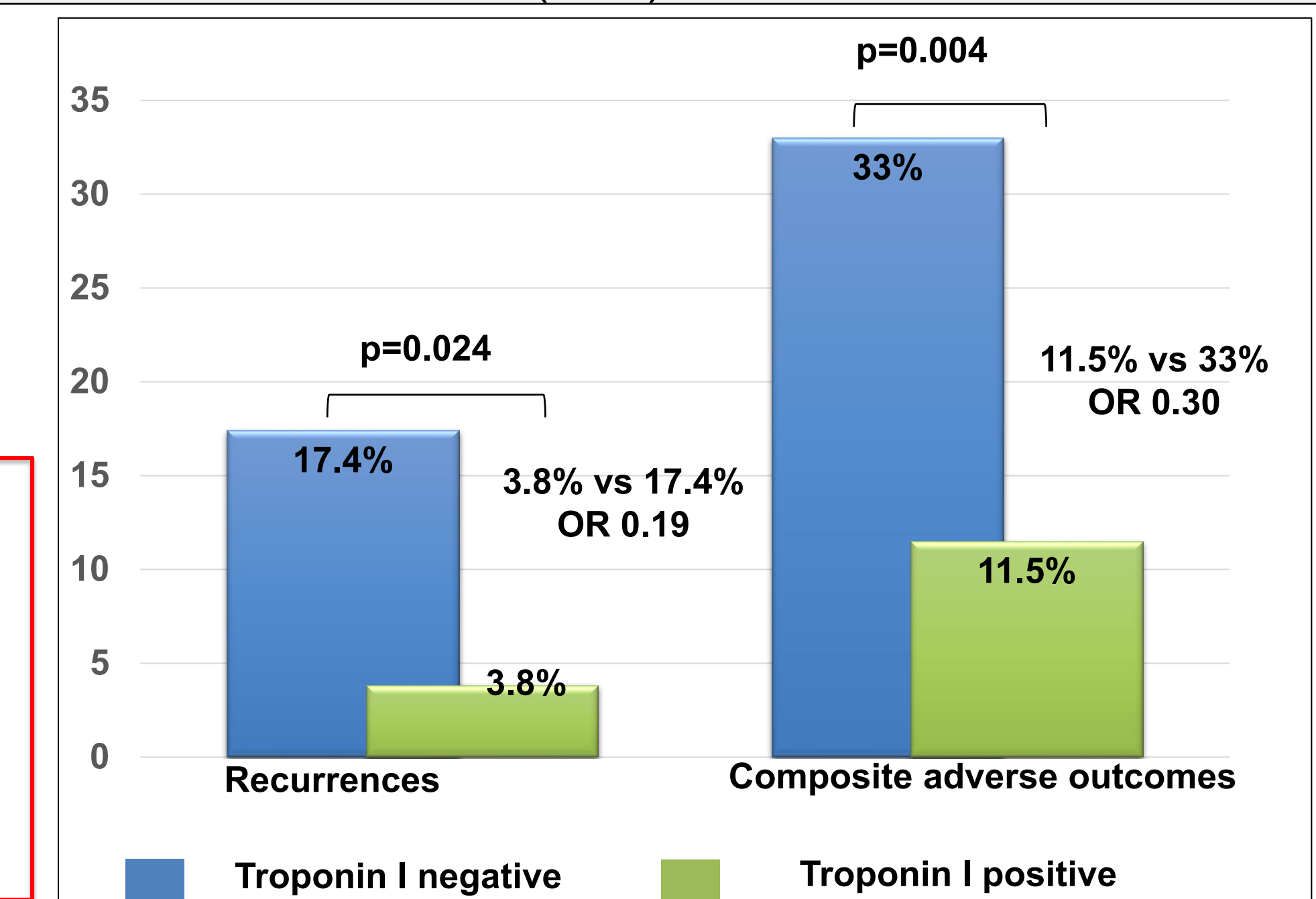
Characteristics of the cohort comparing idiopathic and post-cardiac injury etiologies

	Idiopathic pericarditis (n=126)	Post-cardiac injury pericarditis (n=79)	p-value
Demographic Characteristics			
Age, years	48 [34-58]	61 [50-71]	<0.001
Race			<0.001
Caucasian	49 (38.9)	55 (69.6)	
African American	70 (55.6)	14 (17.7)	
Other	7 (5.6)	10 (12.7)	
Medical History			
Diabetes	21 (16.7)	27 (34.2)	0.006
Coronary artery disease	17 (13.5)	33 (41.8)	<0.001
Congestive heart failure	15 (11.9)	28 (35.4)	<0.001
Atrial fibrillation	12 (9.5)	48 (60.8)	<0.001
Subacute presentation	8 (6.3)	1 (1.3)	0.158
Laboratory			
Troponin>0.09 ng/mL (% cases among those with biomarker available)	10 (9.2)	25 (57.9)	<0.001
Outcomes			
Failure to treat	13 (10.3)	2 (2.5)	0.037
Recurrent pericarditis	26 (20.6)	9 (11.4)	0.126
Failure of treatment and recurrences	33 (26.2)	10 (12.7)	0.022
Cardiac tamponade	13 (10.3)	9 (11.4)	0.821
Constrictive pericarditis	7 (5.6)	1 (1.3)	0.155
Composite adverse outcome	44 (34.9)	18 (22.8)	0.085

Elevated troponin I levels, independent of the nature of pericarditis, identified a group of patients less likely to experience the composite outcome (12% vs 33%, OR 0.26 [0.10-0.67], p=0.003), and, in particular, recurrent pericarditis (4% vs 17%, OR 0.19 [0.04-0.85], p=0.017).

Conclusion

Acute pericarditis was associated with a significant number of adverse outcomes. Idiopathic pericarditis, subacute presentation, and lack of elevated troponin I levels are associated with higher incidence of adverse outcomes.



Disclosure: The study was supported by Kiniksa Pharmaceuticals, Ltd. Clarendon House 2 Church Street Hamilton HM 11 Bermuda. Telephone: +1-781-431-9100. Anna Beutler and John Paolini report being employees of Kiniksa Pharmaceuticals Corp. as potential conflict of interests for the study.