

Alessandra Vecchié, MD; Juan Guido Chiabrando, MD; Megan Dell, BSBME; George Wohlford, PharmD; Sherrie Tafuri, PhD; John F. Paolini, MD, PhD; Benjamin Van Tassell, PharmD; Anna Beutler, MD; Tamas Gal, PhD; Fabrizio Montecucco, MD, PhD Antonio Abbate, MD, PhD

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

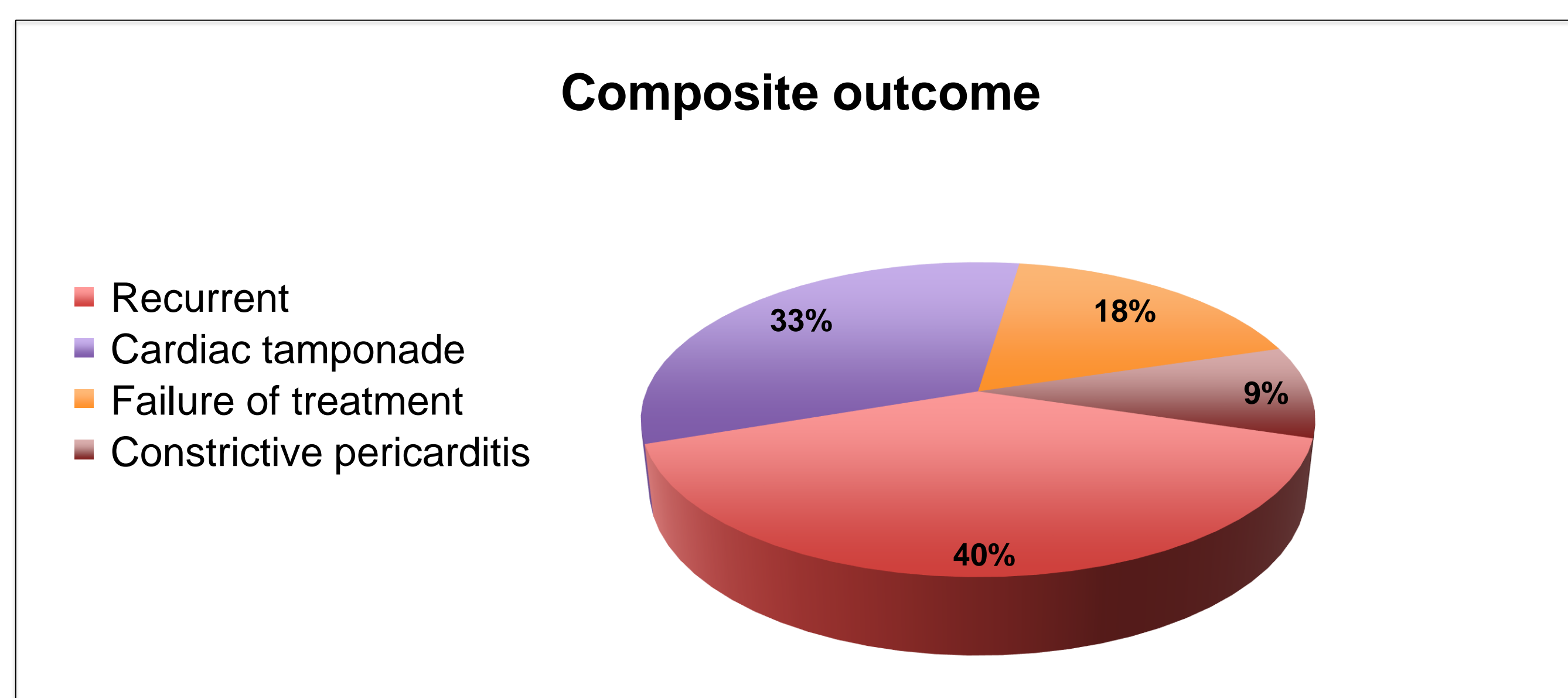
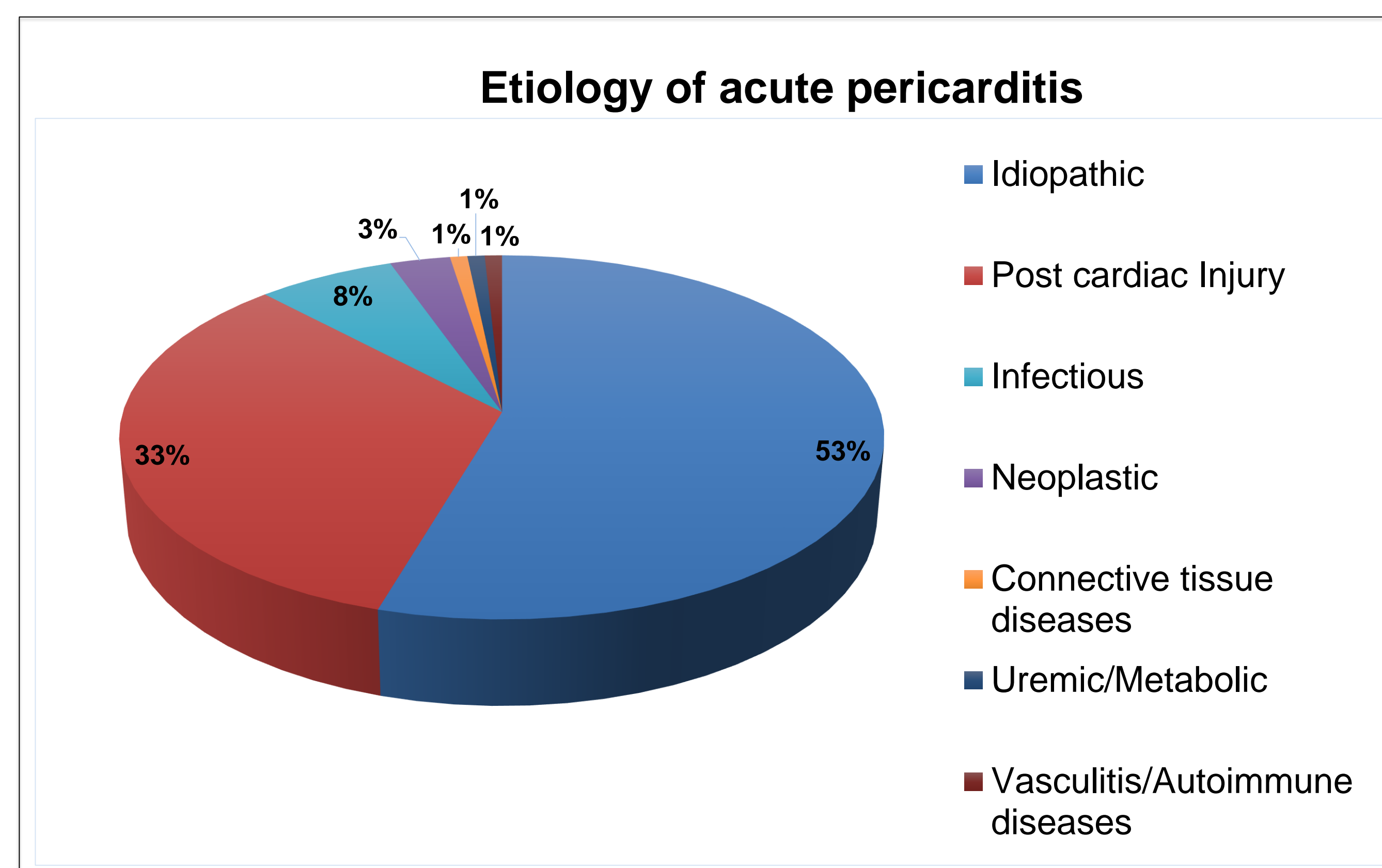
Clinical characteristics of patients with pericarditis may help predict adverse outcomes.

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.

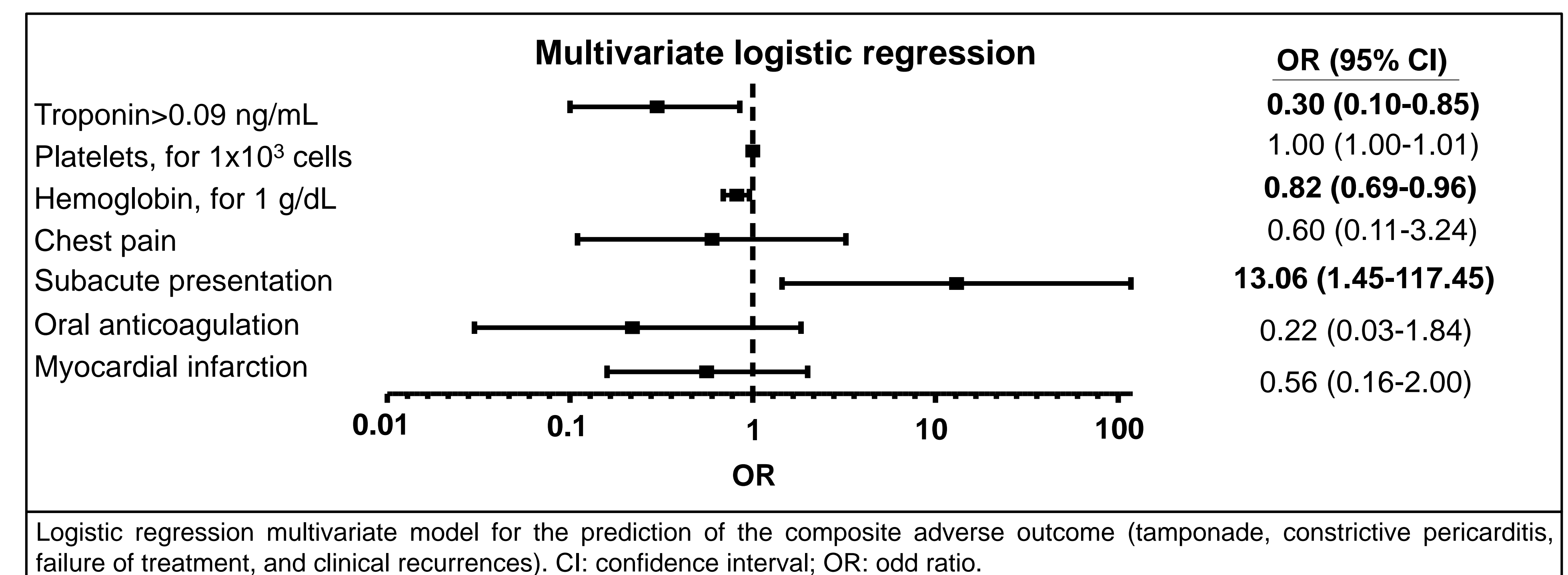
Results

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.



| 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), 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).

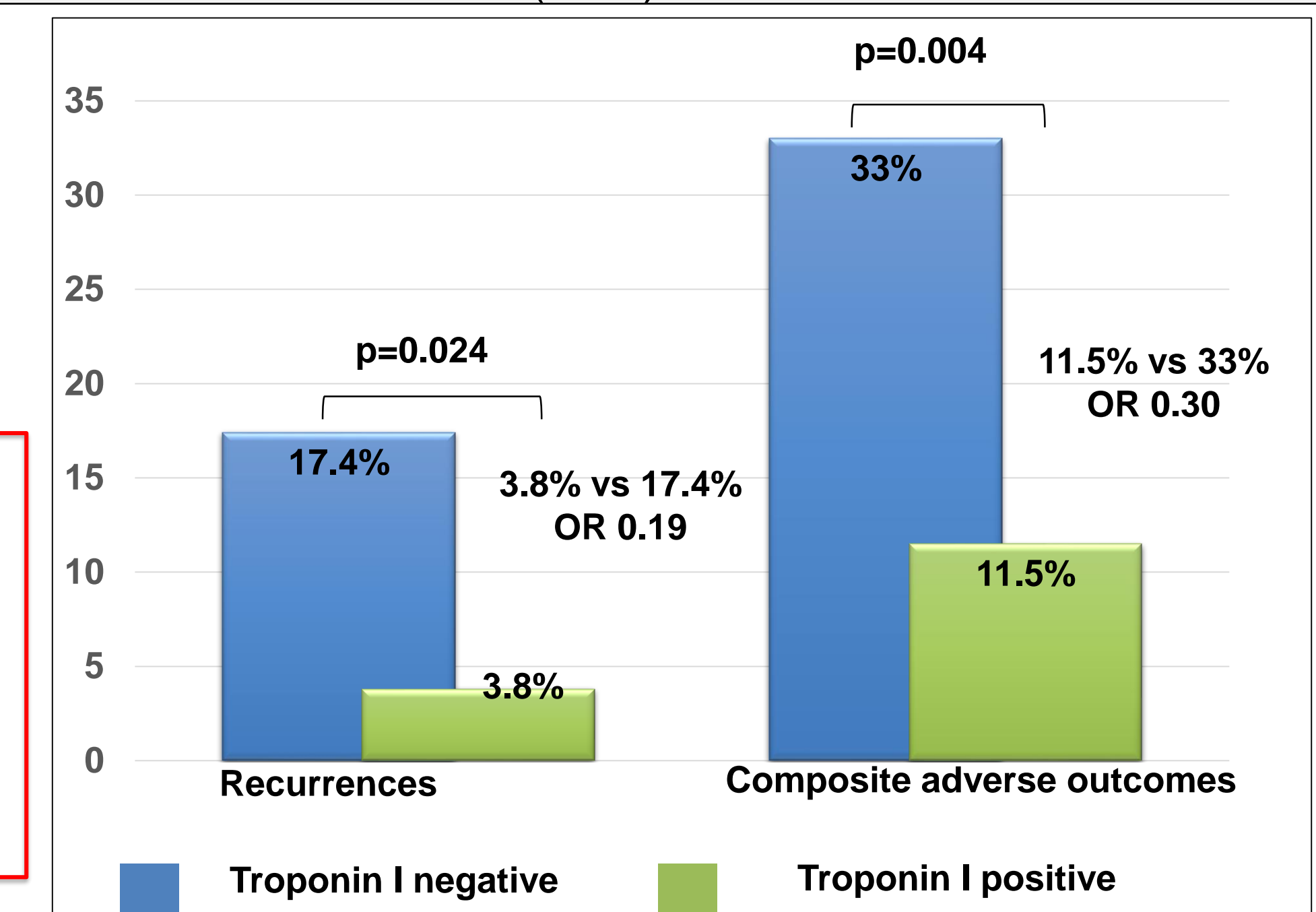


| Characteristics of the cohort comparing idiopathic and post-cardiac injury etiologies | | | |
|---|---------------------------------|---|---------|
| | Idiopathic pericarditis (n=126) | Post-cardiac injury pericarditis (n=79) | p-value |
| Demographic Characteristics | | | |
| Age, years | 48 [34-58] | 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, independently 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.



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