**Introduction**: Immunosuppressive therapy with steroids has become the cornerstone of treatment of cardiac sarcoidosis (CS). There is limited data on the factors affecting the clinical response to therapy. The objectives of this study were to evaluate the response to immunosuppressive therapy in CS and identify predictors of poor response.

**Methods**: Data of 90 consecutive patients with CS from the Granulomatous Myocarditis Registry was analyzed. Data regarding clinical presentation, co-morbidities, baseline electrocardiogram, echocardiogram, and 18- Fluorodeoxyglucose (FDG) PET-CT were extracted from the registry database. All patients were treated with a standard treatment regimen of corticosteroids and methotrexate. Response to therapy was assessed 3-6 months after initiation of immunosuppression. Clinical response (CR) was defined as a reduction in NYHA Class > 1 and/or freedom from ventricular arrhythmias and heart failure hospitalizations. Disease activity response (DAR) was defined as either a repeat FDG PET showing complete resolution of myocardial uptake or improvement in left ventricular Ejection Fraction (LV EF) > 10% (in patients with a reduced EF at therapy initiation). Complete responders fulfilled both CR and DAR criteria. Partial responders had either CR or DAR and non-responders had neither CR or DAR.

**Result**: Among the 90 patients receiving immunosuppression, 35(38.9%) were complete responders, 25(27.8%) were partial responders, and 30(33.3%) were non-responders. Univariate analysis comparing complete responders and non-responders revealed that a lower LV EF (49.4±13.7 vs. 39.6±14.9, p=0.002) and reduced myocardial maximum standardized uptake value (SUV) on 18-FDG PET (7.9 ± 4.8 vs. 5.3 ± 4.0, p=0.022) were predictors of non-response. When comparing all responders (complete and partial) and non-responders, the same parameters were found to be significant. Logistic regression identified two independent predictors of non-response to immunosuppression: LV EF < 40% (HR 1.61, 95% CI 1.06-7.69, p=0.012) and maximum SUV <5.5 (HR 1.28, 95% CI 1.05-6.12, p=0.005). The final prediction model had a good discriminatory power (Area under the curve 0.82).

**Conclusion**: A reduced LV EF and lower myocardial uptake on 18-FDG PET are independent predictors of poor response to immunosuppression in patients with CS.