

Strain in Children with MIS-C and Acute COVID-19

Prashant Minocha¹, Ranjini Srinivasan¹, James Babb¹, Rakesh K. Singh¹, Colin Phoon¹, Donna Better², and Puneet Bhatla¹

¹NYU Langone Health

²NYU Langone Hospital - Long Island

July 19, 2022

Abstract

Background: Cardiac injury has been described in children with both acute COVID-19 and the multisystem inflammatory syndrome in children (MIS-C). Strain has been shown to be a sensitive measure of systolic function and can be used for detecting subclinical left ventricular (LV) dysfunction. We sought to describe strain findings in both groups on initial presentation and outpatient follow up. Methods: A retrospective study analyzing echocardiograms of all patients presenting with acute COVID-19 infection and MIS-C at our institution between March 2020 and December 2020 was performed. TOMTEC software was used for strain analysis in both study groups (COVID-19 and MIS-C) and age matched healthy controls. Regional strain was obtained and comparison amongst groups was performed using the Mann-Whitney U test. Strain was compared against LV ejection fraction (EF) as measured by 5/6 area length method. Results: 45 patients (34 MIS-C and 11 COVID-19) met inclusion criteria. There was a statistically significant decrease in LV longitudinal strain ($p < 0.001$), LV circumferential strain ($p < 0.001$) and left atrial strain ($p = 0.014$) in the MIS-C group when compared to the control group. There was a statistically significant decrease in LV longitudinal strain ($p = 0.028$) in the acute COVID-19 group. All patients with abnormal LVEF had abnormal strain. However 14 patients (41%) in the MIS-C group and 3 (27%) in the acute COVID-19 group had preserved LVEF but abnormal strain. Abnormal strain persisted in one-third of patients in the MIS-C and acute COVID-19 groups on outpatient follow up. Conclusion: Patients with MIS-C and acute COVID-19 can develop myocardial dysfunction as seen by abnormal strain. Strain may provide an additional tool in detecting subtle myocardial dysfunction. It can be routinely employed at diagnosis and at follow up evaluation of these patients.

Hosted file

STE in COVID_PM 7.16.22.docx available at <https://authorea.com/users/496160/articles/577675-strain-in-children-with-mis-c-and-acute-covid-19>