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Short Term Outcomes in Multisystem Inflammatory Syndrome in Children (MIS-C) Related to COVID-19

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Background

- In April 2020, the first reports of a pediatric post-COVID-19 hyperinflammatory response emerged, now termed MIS-C.
- Mortality in MIS-C has been low in several case series [1-4].
- Length of stay (LOS) has been near a week in most studies [3], with mean Intensive Care Unit LOS of 8 days [4].
- Inflammatory and cardiac outcomes have been reassuring.:
 - One case series reported marked decline in inflammatory biomarkers and complete recovery of left ventricular function (LVF) in 71% of patients [3].
 - Ramcharan et. al found that 80% of patients had stable echocardiogram findings and no new coronary artery changes or declines in cardiac function at first clinical follow-up.

Objective

- Describe the short-term outcomes of the first 18 cases of MIS-C, who presented for care to a tertiary pediatric referral center in New York City.

Methods

- We conducted retrospective chart review of patients who met MIS-C criteria based on the NYS DOH case definition and who were admitted to a single center in NYC, between April 24 and July 1, 2020. [5]
- We collected clinical, laboratory, and cardiac data from hospital admission and subsequent outpatient follow up through September 2020.

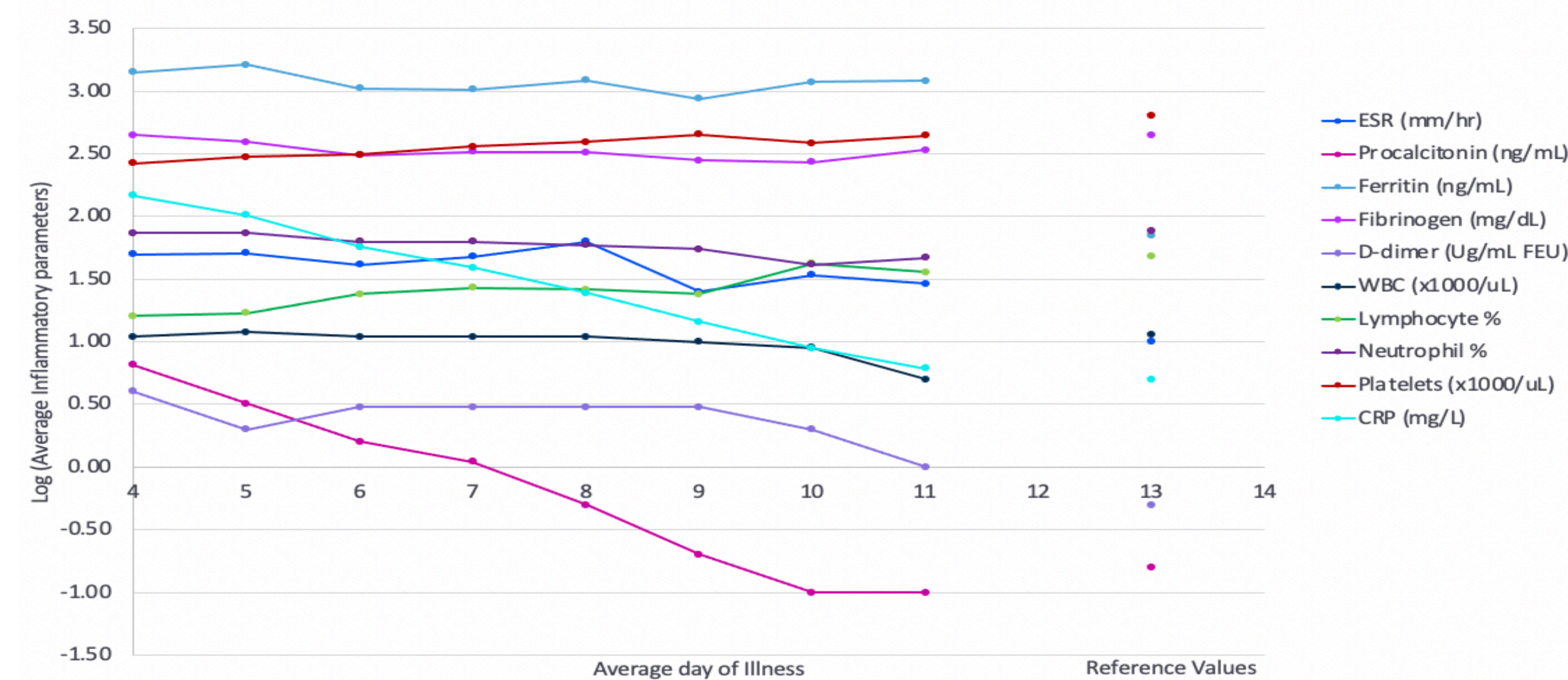
Results

- LOS was 2-13 days (mean 7 days).
 - One patient expired on day 9 of hospitalization. He was on ECMO & death was secondary to intracranial hemorrhage.
- All patients were discharged on anticoagulation therapy for a maximum of 14 days & 6 were transitioned to ASA until cardiac function normalized.

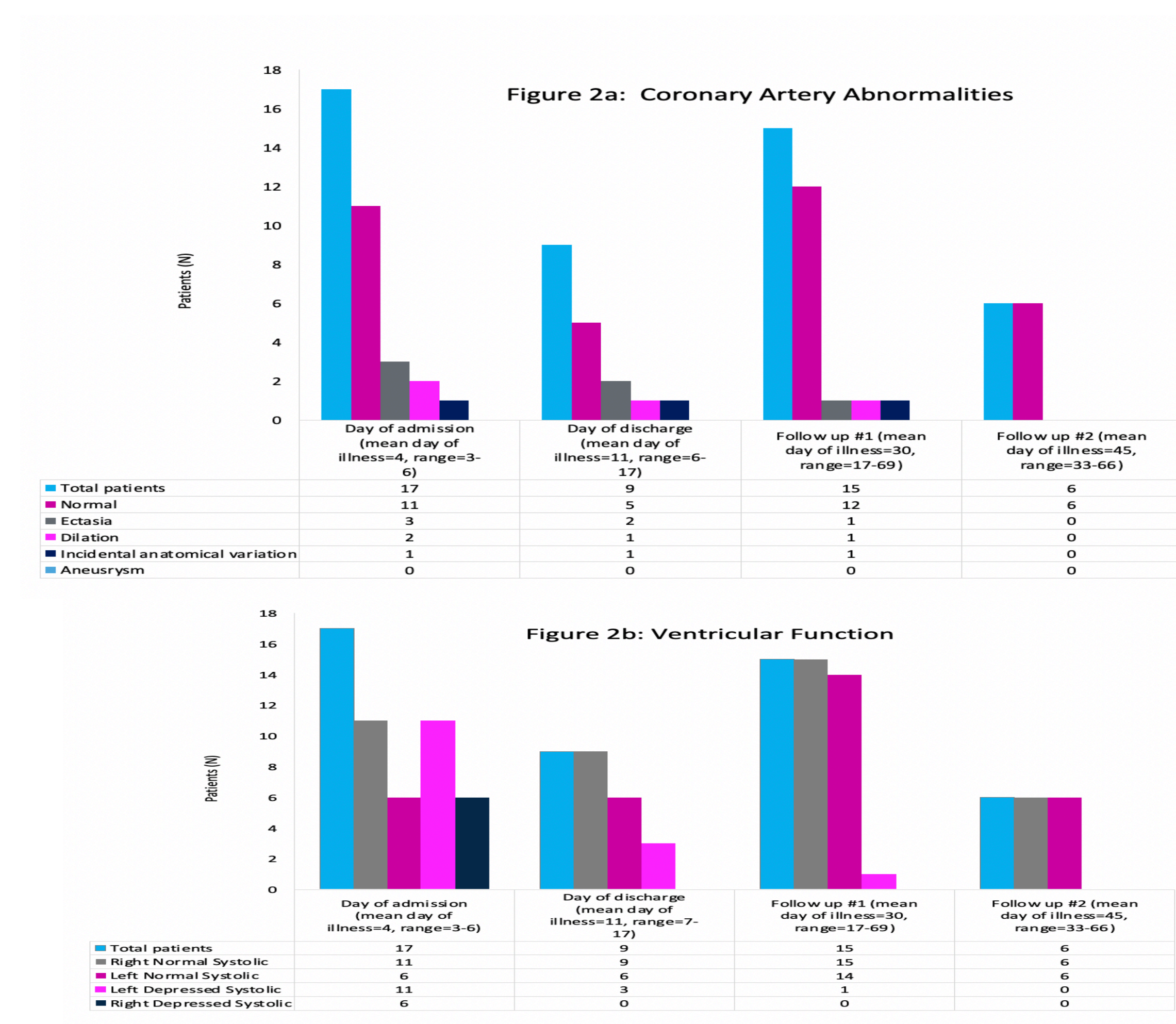
Results

- One patient was readmitted with a small subdural hematoma at day 13 post discharge and recovered without neurosurgical intervention.
- Four patients had bruising at their follow up visit 7-12 days after hospital discharge.
- One patient had ventricular tachycardia during admission & will continue Amiodarone for 3-6 mos.
- At discharge, all patients had near normalization of inflammatory markers (**Figure 1**)
 - Ferritin, D-dimer, and WBC differential were not normalized by discharge date.
 - Normalization achieved by first follow up visit (average day of illness 30).

Figure 1: Day of Illness vs Inflammatory parameters (Average values)



- Coronary artery abnormalities and LVF were observed during hospitalizations in 5 (27%) & 11 (61%) patients, respectively.
- By day 6-35 post discharge (mean 20 days) 2 patients had complete improvement of coronary artery abnormalities, while 1 patient had improvement but still depressed LVF.
- By day 22-52 post discharge (mean 41 days) all cardiac abnormalities had resolved (**Figure 2a-2b**).
- All patients had normalization of cardiac enzymes prior to hospital discharge.



Conclusions

- Although patients with MIS-C can present with severe hyperinflammatory disease, most of the patients at our academic center had resolution of symptoms and normalization of laboratory parameters within weeks of initial symptoms.
- We observed one mortality and one re-admission related to anticoagulation complications.
- Our findings underscore the need to carefully weigh the risks and benefits of anticoagulation therapy and to monitor this treatment closely.
- Further research is needed to determine long-term outcomes in MIS-C.

References

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