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Original Research Paper

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CLINICAL PROFILE OF MIS-C AND KD IN A TERTIARY CARE HOSPITAL IN PANDEMIC PERIOD AND COMPARISON OF THE INCIDENCE OF KD IN THE PRE PANDEMIC PERIOD : A ONE YEAR PROSPECTIVE OBSERVATIONAL STUDY.

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ABSTRACT Multi systemic inflammatory syndrome in children (MIS-C) is an inflammatory syndrome seen in children secondary to COVID 19, having overlapping features with Kawazaki disease (KD). In the present study we are comparing the clinical features of MIS-C and KD and also comparing the incidence of classical KD during COVID-19 pandemic and pre pandemic period

KEYWORDS :

The corona virus 2019 pandemic (COVID19) witnessed emergence of a new inflammatory syndrome, Multisystem inflammatory syndrome in children (MIS-C) which have overlapping features with Kawasaki disease (KD), Toxic shock syndrome or myocarditis [1]. KD is a systemic vasculitis predominantly occurring in children less than 5 years, with predilection for coronary artery involvement. The proponents of a connection between MISC and KD argue that both conditions are inflammatory response to an infectious aetiology predominantly viral infection. Opponents argue the salient differences in the clinical presentation in two conditions [2]. Moreover studies from Japan and other countries showed a decline in the incidence of classic KD after the onset of COVID 19 pandemic [3].

We conducted this study to evaluate the differences in clinical presentations of KD and MIS-C in a tertiary hospital during COVID-19 pandemic and also to compare the incidence of classical KD during the pandemic period and pre pandemic period. Institutional ethical committee clearance was obtained before starting the study.

This prospective observational study was conducted at a tertiary care hospital in South India, the largest referral paediatric hospital in Kerala. All children diagnosed and treated in our hospital as KD and MISC from April 2020 to March 2021 (one year) were included in the study. KD was diagnosed based on the AHA criteria [4] and MISC was diagnosed based on WHO clinical criteria [5]. The children were evaluated by a paediatric cardiologist and were managed as per the hospital protocol. All details were entered in the data abstraction proforma. The number of children affected with KD in the previous year (April 2019 to March 2020) and their details were collected from the medical records library.

During the study period there were 17 cases diagnosed as KD and 40 cases diagnosed as MIS-C. Mean age in the KD group was 3.8 years compared to 7.5 years in MISC group. In the KD group majority were less than 5 years (65%) whereas majority of children in MISC group were above 5 years (88%). The significant difference noted in the age group is the characteristic feature of MIS-C. Male predilection noted in both groups is also described previously . The male to female ratio of KD in most studies is around 1.5-1.6 [2]. In various case series in MIS-C, 50-60% is contributed by male gender [6]. There was one study identifying a genetic susceptibility leading to this male preponderance of KD [7].

The clinical features in KD group and MISC group are presented in Table 1. Rash, conjunctival congestion and mucosal changes were more common in the KD group. Gastrointestinal symptoms like abdominal pain, vomiting and diarrhoea are more common in MISC group (87%) compared to KD group (35%). 62.5% of cases in MISC group presented as shock, of which left ventricular dysfunction by echocardiography was present in 52% cases. In KD group,, 5 cases (29.4%) had shock at presentation, but none had LV dysfunction. Coronary involvement in echocardiography (coronary dilatation and echogenic coronaries) were present in all 17 cases in KD group whereas 35 children in MIS-C had coronary involvement. Of the 17 cases in the KD group, 5 children had overlapping features like abdominal pain, shock etc and all of them were above 5 years old.

Even though KD and MIS-C are hyper inflammatory states with some similarities there is considerable difference in their clinical presentation. MIS-C present at an older age , have more gastrointestinal manifestations, more profound inflammatory manifestations leading to higher propensity to develop shock and cardiac dysfunction. All these features suggest that even though KD and MISC are hyper inflammatory syndromes, both are having significant differences in presentation with some overlap [2,8].

The number of cases fulfilling diagnostic criteria of KD during the study period was 17 whereas number of cases admitted in the pre pandemic period (one year) was 33. This study has shown a 50 % reduction in incidence of KD during the pandemic period compared to pre pandemic period. This

finding is consistent with most of the studies in different parts of world [3,9]. KD is a complex inflammatory syndrome presumed to be triggered by an infectious aetiology . Probable infectious aetiologies postulated are RSV ,Roseola infantum, influenza and mycoplasma. Studies have shown that protective measures taken to control COVID 19 have led to a decline in incidence of other infectious diseases, especially respiratory pathogens which reduced the incidence of KD [10]. Majority of children of KD group received IVIg as first line treatment whereas majority of those in the MIS-C group received methyl prednisolone. All cases responded well to these drugs but 4 cases in the MISC group received both. 45% cases of MIS-C needed inotropes compared to 17% cases in KD group.

Based on this prospective study, we propose that KD and MISC are two different spectrum of manifestations which follow an infectious trigger. Immediate recognition of this syndrome is important for the emergency management with IVIG or steroids as they have more chance of developing shock and LV dysfunction. Further studies in large cohort are required to identify the differences in the level of inflammatory markers in these conditions and their genetic susceptibility.

Legends to Table

Table 1: Table showing comparison of clinical features in KD and MISC cases

	KD (17)	MISC (40)
Mean age	3.8 ± 1.2 years	7.5 ±1.8 years
Proportion less than 5 years	11 (65%)	5 (12%)
Proportion more than 5 years	6 (35%)	35 (88%)
Male	13 (92%)	26 (65%)
Female	4 (8%)	14 (35%)
Fever	17 (100%)	40 (100%)
Rash	13 (76.4%)	26 (65%)
Conjunctival congestion	16 (94%)	33 (82.5%)
Oral mucosal changes	17 (100%)	15 (37.5%)
GI symptoms	6 (35%)	35 (87%)
Shock	5 (29.4%)	25 (62.5%)
Respiratory symptoms	0 (0%)	9 (22.5%)
Neurological symptoms	1 (5.8%)	6 (15%)
LV dysfunction	0 (0%)	13 (32.5%)
Coronary involvement	17 (100%)	35 (87.5%)
Inotropes	3 (17.6%)	18 (45%)
IVIG	11 (64.7%)	6 (15%)
Methyl prednisolone	6 (35.2%)	30 (75%)
IVIG + Methyl prednisolone	0 (0%)	4 (10%)

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