Indian Journal of Pediatrics (July 2025) 92(7):783–784
https://doi.org/10.1007/s12098-025-05548-0

SCIENTIFIC LETTER

Immunological Analysis of Different Treatment Strategies for Multisystem Inflammatory Syndrome in Children (MIS-C)

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Received: 11 February 2025 / Accepted: 11 April 2025 / Published online: 9 May 2025

To the Editor: MIS-C is an uncommon but devastating illness that occurs mainly in children after exposure to SARS-COV-2 [1]. Early diagnosis, rapid treatment with supportive care, anti-inflammatory medications, and/or immunosuppressants & immunomodulators with a multidisciplinary approach is essential for effective management of this condition. However, the optimal therapeutic strategy remains obscure [2]. Our earlier report deciphered that cytokines upsurge during MIS-C [3]. Hence we analysed the cytokine levels during treatment with different treatment strategies so as to identify the most effective treatment option, with a focus on LMICs. Stored plasma samples of 45 children, hospitalised with MIS-C, who received one of the treatment regimens [MPS alone, IVIG alone or both together (MPS+IVIG)] were used. Circulating plasma levels of cytokines (IFNγ, IL-2, TNFa, IL-1a, IL-17A, CCL2, CCL3, GM-CSF, IL-6) were measured by Luminex Magpix Multiplex Assay system. Since hyperinflammation during MIS-C is related to NETs [4], we also quantified elastase, alpha-1 antitrypsin and angiostatin in circulation during treatment as these molecules are involved in NET formation. There was a significant decrease in the secretion of CCL2 ($p=0.011$), GM-CSF ($p=0.038$) and IL-1a ($p=0.046$) in the MPS+IVIG group, whereas, IFNγ ($p=0.006$) showed significantly reduced secretion in the MPS group (Supplementary Table S1). IL-6 was significantly reduced in both MPS ($p=0.020$) and MPS+IVIG ($p<0.001$) treatment arms. Angiostatin, an inhibitor of angiogenesis and NET formation, declined significantly ($p<0.001$) with MPS therapy whereas serpin reduced significantly ($p<0.001$) with combined MPS+IVIG therapy. To conclude, treating MIS-C with MPS alone significantly reduced important cytokines amongst the cytokine storm and also angiostatin. These observations suggest that MIS-C can be treated effectively with MPS in resource-limited settings where IVIG is not readily available.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12098-025-05548-0.

Funding This study was funded by ICMR-NIRT intramural funds.

Declarations

Conflict of Interest None.

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