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The cytokine profile of cerebrospinal fluid in Multi-Inflammatory Syndrome in Children

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BACKGROUND AND AIM

Multi-inflammatory syndrome in children (MIS-C) is characterized by hyperinflammation following infection or exposure to SARS-CoV-2 in children and young people. Approximately a third of MIS-C cases have central nervous system manifestations ranging from cephalgia to fulminant necrotising encephalitis. The pathogenesis of neurological involvement in MIS-C is unknown. Here, we characterise and compare the expression of 6 cytokines of the cerebrospinal fluid (CSF) of a small cohort of children with MIS-C and neurological involvement versus non-inflammatory controls.

METHODS AND PARTICIPANTS

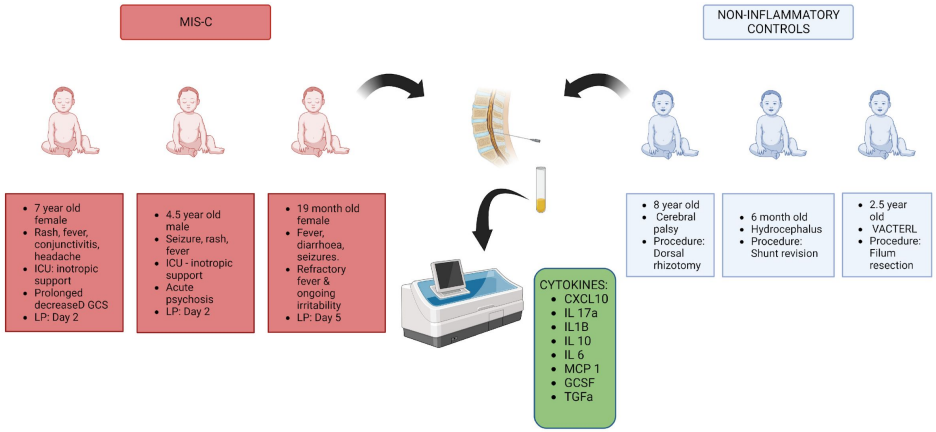

Figure 1. Three children with MIS-C and neurological involvement underwent lumbar puncture as part of routine clinical protocol and CSF was acquired for cytokine analysis. Control CSF was acquired from three children without underlying inflammation during neurosurgical intervention. CSF was analysed using a Multiplex Luminex assay.

RESULTS

CYTOKINE	FOLD CHANGE
CXCL 10	7.1
IL 10	33.1
IL 17a	4.1
IL 6	7.8
GCSF	26.6
TGFa	1.3
IL 1b	34.3
MCP 1	1.9

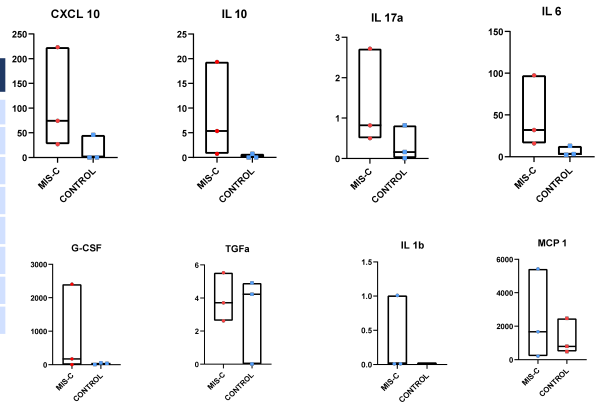

Figure 2. Box plots demonstrating specific cytokine levels in the CSF of 3 patients with MIS-C (red) compared to non-inflammatory controls (blue). Fold change of the mean of each cytokine in those with MIS-C compared to controls is displayed in the table on the left.

CONCLUSIONS

In a small number of patients, we show that certain inflammatory cytokines are raised in the CSF of children with MIS-C and neurological manifestations. Understanding the specific cytokine profile of this condition may be key in efforts to understand pathogenesis and identify potential treatment targets. These data underpin the need for further studies investigating the mechanism of CNS disease in MIS-C, where specific patterns of cytokine expression and correlation with haematological cytokine parameters may elucidate both the immunological basis of neurological dysfunction and potential therapeutic interventions.

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