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Liver involvement in COVID 19 related pediatric multisystem inflammatory syndrome: a single center experience

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Objectives and Study: Multisystem Inflammatory Syndrome in Children (MIS-C) is a condition characterized by fever, inflammation and multiorgan dysfunction that manifests late in the course of SARS CoV-2 infection.

Gastrointestinal symptoms are common findings in children with SARS CoV-2 infection, but they are usually mild. In contrast, MIS-C is characterized by more frequent gastrointestinal manifestations with greater severity. Hepato-biliary involvement is common.

Pediatric data is still limited but indicate that children affected by MIS-C have shown a higher risk than children with acute SarsCov2 infection to experience an Acute Liver Injury (ALI). The prevalence of ALI in children with MIS-C is 51% (vs 31% of children with COVID-19). The severe form of ALI (ALT>5ULN) is present in 4% of children with MIS-C (vs 8% COVID-19). 1 case of Acute liver failure (ALF) in a child with MIS-C was described.

Children with elevated ALT in the COVID-19 cohort more frequently carried an underlying medical condition as immunocompromised state, obesity or chronic liver disease. MIS-C affects previously healthy children.

Methods: We analyzed liver involvement in 31 children (17 males and 14 females) admitted to a Tertiary Care Pediatric Hospital from November 2020 to March 2021, with a final diagnosis of MIS-C. Acute liver involvement (ALI) was defined based on abnormalities of liver and/or cholestatic enzymes with or without signs of liver dysfunction. Enrolled populations were categorized in children with ALI present (ALI-MISC) and without ALI (NLI-MISC).

Results: Acute liver involvement (ALI) was documented in 10/31 children with MIS-C (32%), with a mean level of AST and ALT of 104 UI/L and 84 UI/L, respectively, without signs of cholestasis. A moderate ALI was documented in 2/10 children (with ALT>5ULN), but none of them showed liver failure. Fifty % of ALI-MISC showed hypotension and/or multiorgan failure (MOF) (versus 23% of NLI MIS-C). Incidence of obesity among children with liver injury (ALI-MIS-C) is about 20%, not different from children without liver disease (NLI-MIS-C).

Among MIS-C children with ALI, 25% showed a bright liver at ultrasound. Acute liver injury spontaneously recovered within a month and in 75% steatosis disappeared.

7/10 ALI-MIS-C children showed other signs of gastrointestinal involvement.

In ALI-MIS-C levels of procalcitonin, triglycerides, dimer and BNP resulted significantly higher than NLI-MIS-C.

Conclusions: We reported a lower incidence of liver involvement in our cohort MIS-C than previously described, coexisting with a lower incidence of MOF, probably depending on an earliest diagnosis and care.

Obesity does not appear to be a risk factor for liver injury in children with MIS C, as previously described. Liver injury during MIS-C has a favorable course, but it seems related to a more severe phenotype and high risk of MOF and could be considered a red flag for second line treatment needed.

References:

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