Hemophagocytic Lymphohistiocytosis in COVID-19: Risks, Outcomes, and Healthcare Burden Analysis

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Introduction

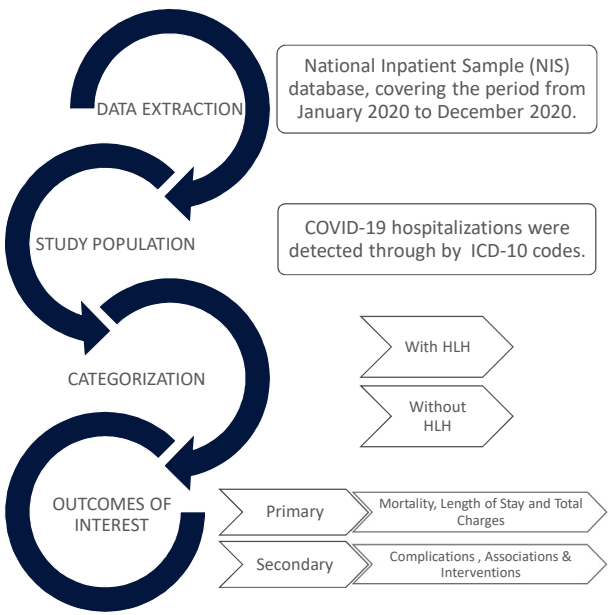
Hemophagocytic Lymphohistiocytosis (HLH) presents as a rare, life-threatening hyperinflammatory syndrome. It arises from uncontrolled activation of cytotoxic T lymphocytes and Natural Killer (NK) cells, culminating in a cytokine storm and subsequent macrophage activation.[1] COVID-19 induces a dysregulated immune response and infrequently gives rise to HLH.[2]

This manifests clinically as fever, hepatosplenomegaly, cytopenia, and carries a high risk for multiorgan system failure.[3]

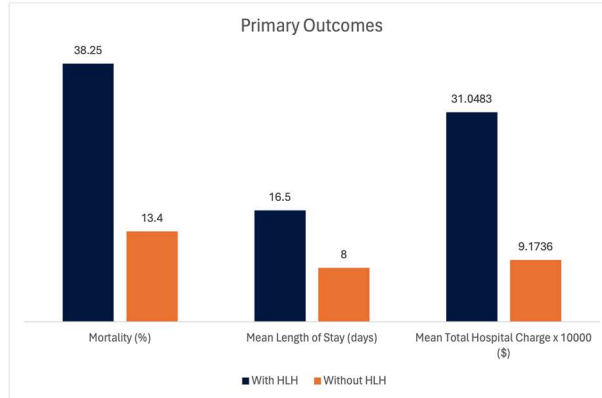
Objectives

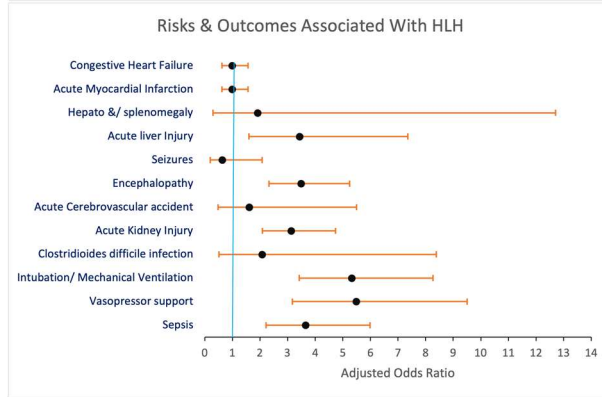
Only isolated case reports and small case series of HLH in COVID-19 exists,[4] however no literature has been available studying clinical and economic outcomes of HLH in COVID-19 patients through uniform samples of data, prompting our retrospective study utilizing the National Inpatient Sample (NIS) database.

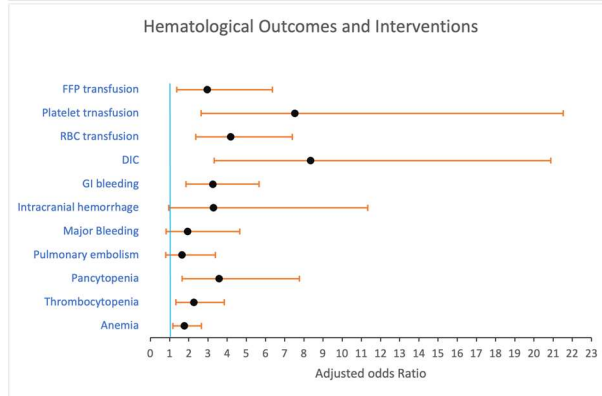
Methods



Results







Discussions

HLH patients were generally younger, more likely to be male, and diagnosed in large urban teaching hospitals, emphasizing the need for increased awareness and diagnostic tools, like the H-score,[5] particularly in smaller facilities.

HLH patients had a significantly higher mortality rate (38.25%) compared to non-HLH patients (13.40%), with longer hospital stays and substantially higher total charges, highlighting the burden on healthcare resources and the importance of timely intervention and resource allocation.

HLH patients had a greater risk of encountering sepsis, requiring vasopressor support, and undergoing intubation/mechanical ventilation, highlighting the severity of the hyperinflammatory response. Differentiating HLH from sepsis is crucial, especially in COVID-19 patients, as treatment approaches differ significantly.

HLH group, showing a higher propensity for pancytopenia, thrombocytopenia, disseminated intravascular coagulation, and gastrointestinal bleeding, translating into a greater need for transfusions, emphasizing the importance of tailored clinical management and vigilant monitoring of blood parameters.

Conclusion

HLH significantly impacts COVID-19 outcomes, leading to increased mortality, prolonged hospital stays, and higher healthcare costs.

The clinical profile of HLH is distinct, with associations to sepsis, respiratory interventions, and multiorgan dysfunction, affecting hematological parameters.

Heightened awareness, early detection, and strategic management of HLH in COVID-19 are essential, necessitating further research into its pathogenesis for targeted interventions and complication prevention.

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