Recommendations for anticoagulation and thrombosis management of pediatric COVID-19 – a single center multidisciplinary consensus

Michele Loi[1], Brian Branchford[1], John Kim[1], Chelsea Self[1], and Rachelle Nuss[2]

[1]Children's Hospital Colorado
[2]University of Colorado Denver

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Abstract

Coronavirus Disease 2019 (COVID-19) is associated with hypercoagulability and adult guidelines have been published regarding the evaluation and anticoagulation of adults infected with COVID-19. Pediatric resources on this topic are lacking. We developed preliminary recommendations for the thrombotic evaluation and anticoagulation treatment for children hospitalized with COVID-19 by reviewing the available literature and guidelines and adapting the information for the pediatric population through a multidisciplinary consensus driven approach.

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Table 1. Recommendations for evaluation, prevention and treatment of pediatric COVID-19 related VTE

CLINICAL PARAMETER	PEDIATRIC RECOMMENDATIONS	OTHER CONSIDERATIONS
Laboratory evaluation and monitoring	• We recommend obtaining a complete blood count (CBC) with platelet count, fibrinogen, prothrombin time, D-dimer on admission and serially for monitoring	• Common findings: o Elevated D-dimer o Elevated fibrinogen o Mildly decreased platelet count o DIC • Increases in D-dimer and DIC severity may indicate worsening disease process
Imaging	• Baseline or surveillance imaging are not recommended in the absence of clinical symptoms of venous thromboembolism • Imaging may not be needed prior to initiation of therapeutic anticoagulation if a thromboembolic event or pulmonary embolus is strongly suspected	• Type of imaging for diagnosis of VTE should consider hospital epidemiologic practices and risks of exposure during transport and while obtaining the study
Risk Evaluation for thrombosis	• We recommend that all pediatric patients admitted for management of SARS-CoV-2 infection be evaluated upon admission, and daily thereafter for thrombotic risk and • We recommend that all patient patients at risk for thrombosis with SARS-CoV-2 infection be initiated on mechanical and/or pharmacologic prophylaxis, if appropriate	• Risk factors for thrombosis to consider: o Personal history of thrombophilia or VTE o First degree relative with VTE o Presence of central venous line o Post-pubertal age o Decreased mobility from baseline o Burns o Active malignancy o Indications of venous stasis or cardiac low flow state o Estrogen therapy o Active systemic infection o Flare of inflammatory disease o Obesity o Severe Dehydration o Recent surgery or trauma
Pharmacologic Management	• If pharmacologic prophylaxis is indicated, we recommend low-molecular weight heparin or unfractionated heparin over other agents given more extensive pediatric experience with heparin agents • Therapeutic anticoagulation is recommended for patients receiving anticoagulation therapy prior to admission and for patients with highly suspected or demonstrated VTE	• We do not recommend use of direct oral anticoagulants due to limited data in children and adults with COVID-19
Thrombolytic Therapy	• Thrombolytic therapy can be considered for patients with a hemodynamically unstable pulmonary embolus or limb threatening deep vein thrombosis • Overall, we suggest that decision-making for thrombolytic therapy be a coordinated approach involving the critical care team, hematologists and interventionalists	• Systemic alteplase may be preferred over local mechanical thrombolysis given the risk of exposure with transfer to and utilization of an interventional suite, however, contraindications to systemic alteplase must also be considered