

A Systematic Review and Meta-analysis on Risk Factors for Severe COVID-19 Infection among Pediatric Patients



Authors: Felice Isabel De Guzman, MD; Marinella De Jesus, MD; and Rodelia Cipriano, MD

Introduction Since the start of COVID-19 pandemic, data shows that the disease has predominantly appeared in adults, with scant data on the burden of COVID-19 in children. Limited data exist on risk factors for disease severity and death concerning children and other pediatric patients. Given the current body of literature available with regards to COVID-19 in the pediatric population, the results of this study will be significant in the understanding of COVID-19 and the associated risks that may contribute to disease severity among the pediatric population.

Objectives To determine which sociodemographic characteristics, clinical manifestations, comorbid conditions and serum inflammatory markers increase the risk for severe or critical COVID-19 infection among pediatric patients.

Recommendations: Further cross-sectional, case-controlled studies examining the effects of specific well-defined comorbidities are required to examine the effects that such underlying conditions play in COVID-19 severity.

Keywords: Risk factors, demographic data, clinical symptoms, laboratory findings, severe infection, COVID-19 Infection

Methodology A literature search yielded 6 cohort studies were included in this meta-analysis. An electronic search from various search engines and electronic databases was done. The Newcastle-Ottawa risk of bias assessment tool for observational was used to assess the quality of non-randomized studies. Effect of each variable on severity was determined using pooled Risk Ratio for each predictor. Outcome measures of all included studies were pooled using the Inverse Variance method of the Der Simonian-Laird random effects model.

Results The following risk factors, when present in children, may lead to severe manifestations of COVID-19 infection: older age (SMD -0.82), symptoms of dyspnea (RR = 2.56), emesis (RR = 2.95), fever (RR = 1.67), diarrhea (RR = 3.25), myalgia (RR = 3.55), increased C-Reactive Protein (CRP) levels (MD = -6.43), and diabetes (RR=6.36).

A Systematic Review and Meta-analysis on Risk Factors for Severe COVID-19 Infection among Pediatric Patients



Authors: Felice Isabel De Guzman, MD; Marinella De Jesus, MD; and Rodelia Cipriano, MD

Introduction Since the start of COVID-19 pandemic, data shows that the disease has predominantly appeared in adults, with scant data on the burden of COVID-19 in children. Limited data exist on risk factors for disease severity and death concerning children and other pediatric patients. Given the current body of literature available with regards to COVID-19 in the pediatric population, the results of this study will be significant in the understanding of COVID-19 and the associated risks that may contribute to disease severity among the pediatric population.

Objectives To determine which sociodemographic characteristics, clinical manifestations, comorbid conditions and serum inflammatory markers increase the risk for severe or critical COVID-19 infection among pediatric patients.

Recommendations: Further cross-sectional, case-controlled studies examining the effects of specific well-defined comorbidities are required to examine the effects that such underlying conditions play in COVID-19 severity.

Keywords: Risk factors, demographic data, clinical symptoms, laboratory findings, severe infection, COVID-19 Infection

Methodology A literature search yielded 6 cohort studies were included in this meta-analysis. An electronic search from various search engines and electronic databases was done. The Newcastle-Ottawa risk of bias assessment tool for observational was used to assess the quality of non-randomized studies. Effect of each variable on severity was determined using pooled Risk Ratio for each predictor. Outcome measures of all included studies were pooled using the Inverse Variance method of the Der Simonian-Laird random effects model.

Results The following risk factors, when present in children, may lead to severe manifestations of COVID-19 infection: older age (SMD -0.82), symptoms of dyspnea (RR = 2.56), emesis (RR = 2.95), fever (RR = 1.67), diarrhea (RR = 3.25), myalgia (RR = 3.55), increased C-Reactive Protein (CRP) levels (MD = -6.43), and diabetes (RR=6.36).