COVID-19 in the ED Encounter; Characteristics and Predicting Outcomes

Cotton DM, Liu L, Vinson DR, Ballard DW, Sax DR, Hofmann ER, Lin JS, Durant EJ, Kene MV, Casey SD, Ghiya M, Shan J, Bouvet SC, McLachlan ID, Rauchwerger AS, Mark DG, Reed ME

|  |  |
| --- | --- |
| Challenge | Despite significant inquiry into therapies for COVID-19, no therapies have emerged as curative and the modest benefit seen in the best studied therapies are marginal. Therefore, supportive care remains the mainstay of therapy and decision-making around use of supportive care resources (ie, admission to hospital) remains the keystone of COVID-19 care.  |
| Existing Evidence | Understanding who is at risk for progression to severe disease in COVID-19 has relied on population level factors available BEFORE clinical data is available (age, gender, comorbidities) or on clinical data (lab results, vital signs) of patients ALREADY hospitalized; bypassing the most important decision point – the decision to hospitalize from the ED. The limitation of this approach is best seen through consideration of another medical condition we are familiar with, Acute Coronary Syndrome (ACS). We use a Framingham Risk Score to identify patients based on population level factors that may benefit from preventative risk reduction; but this score is not useful on the frontline to determine “is this specific patient having an ACS?” Instead, we use an ACS clinical tool (which focuses on bedside clinical data) to make that determination. Similarly, we would not solely look at patients *already* hospitalized with ACS to determine who *should be* hospitalized for ACS, since patients who have been sent home already or were missed are excluded from this approach.  |
| Target Population | ED encounters (February 21st-April 5 2020) with a first SARS-CoV-2 positive test within 21 days of their ED visit and a visit with symptoms consistent with COVID-19.  |
| Intervention or Exposure | Retrospective cohort study of COVID-19 patients in the ED  |
| **Outcomes/Key Findings** | Of the first 1000 encounters, 802 met our inclusion criteria: 15% were over 75 years; 47% were female, 31% were non-Hispanic white. Overall, 394 were hospitalized and 161 had a critical outcome of death or need for high flow nasal cannula or greater intervention within 21 days. **Independent predictors for our critical outcome included a history of hypertension (OR = 1.7 [1.0-3.1]), abnormal CXR (OR = 2.5 [1.2-5.1]), elevated neutrophil to lymphocyte ratio (OR = 1.7 [1.1-2.7]), elevated BUN (OR = 3.6 [1.8-7.2]), measured fever (OR = 2.2 [1.3-3.7]), and abnormal respiratory vital signs (respiratory rate OR = 3.8 [2.0-7.1], oxygen saturation OR = 8.7 [4.4-17.4]).**  |
| **Resulting Action/Change** | Improved understanding of ED characteristics that predict clinical course in COVID-19 patients seen in the ED. This can be used to:1. Identify patients who are not in overt respiratory failure who may be at risk for progression to critical disease.
2. Conversely, it may offer reassurance for patients with frequently touted population level risk factors (e.g., age) who have reassuring clinical evaluations that they are not at significant risk of progression to critical disease.
3. Could be used when determining monitoring priority and frequency (may increase or decrease perceived risk by population-level factors).
4. Aid in patient / caregiver discussions about risk of disease progression
 |
| Additional Recommendations | We present information to aid in ED-based decision making for COVID-19 care; this data could be used to make a formal risk stratification tool although the dynamic facility resource fluctuations makes that benefit questionable. Additionally, there is early pandemic response data (patient presentation characteristics, ED treatment patterns, RN triage information) that is valuable and not captured elsewhere in the literature; this will be meaningful in the understanding of the natural course of a pandemic response and in preparing for future events.  |
| Implementation Tools  | Publication. Dissemination of findings.  |
| Implementation Measurement | Information gained from this is broad and COVID-19’s impact varies significantly with time and facility; specific implementation measurements are not apparent.  |
| Reference | Cotton DM, Liu L, Vinson DR, et al., Clinical characteristics of COVID-19 patients evaluated in the emergency department: a retrospective cohort study of 801 cases. *JACEP Open*. 2021;2:e12538. <http://doi.org/10.1002/emp2.12538> |