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34 Prolonged N-95 Mask Use Did Not Result in Carbon Dioxide Retention or Clinically Significant pH Changes in One Cohort of Health Care Workers

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Study Objective: Concerns over emerging infectious diseases spread via airborne or respiratory droplet transmission have highlighted the importance of respiratory protection for health care workers. During the current COVID-19 pandemic, widespread use of N95 masks by health care workers helped to prevent transmission and contraction of SARS-CoV2. It is not clear if prolonged continuous use of an N-95 during clinical duties results in any detrimental physiological effects and clinical features from increased carbon dioxide. The primary objective of the study was to evaluate for carbon dioxide retention and/or clinically significant changes in pH with prolonged use of N95 masks. Secondary objective assessed for changes in vital signs and any unexpected subjective symptoms experienced by the study participants.

Methods: 10 healthy emergency medicine residents between the ages of 27 and 31 years old provided written consent. All subjects denied history of structural lung disease (asthma, COPD, interstitial lung disease) and had been previously fit-tested for the correct size of N-95 mask. Each participant was provided a new N-95 mask and instructed to don as if they were about to enter a clinical scenario that would require this degree of respiratory protection. All subjects remained in a seated position and asked to refrain from speaking in order maximize fit of the mask. Venous blood gas samples were obtained prior to donning their mask followed by three additional intervals at 20, 40, and 60 minutes. In addition, vital signs (heart rate, pulse oximetry, blood pressure and respiratory rate) were recorded at each of those four intervals and subjects were ask to self-record any symptoms they experienced prior to each blood draw. Each sample collected consisted of acquiring 2 ml of venous blood, which were analyzed within 30 minutes at the University of Nebraska Medical Center’s core lab. PCO2 and pH was assessed at each of the time intervals and fit with a linear mixed effect model to determine if statistically significant change over time for these measurements. Mean and standard deviations were used to describe the values at each time point. Pairwise comparisons between time points were adjusted using Tukey’s method. All analysis was done using SAS, Version 9.4 and a p-value < 0.05 was considered statistically significant.

Results: The mean carbon dioxide levels at time 0 and 60 minutes were 48.9 (CI, 49.0-56.0) and 48.5 (CI 39.0- 57.0) and there was no statistically significant change across any of the time intervals (p=0.20). There was a small significant increase in the mean pH between the 20-minute assessment and baseline ([7.367, CI 7.350- 7.400] vs [7.381, CI 7.350-7.410] p=0.019), which was not clinically significant. In addition, there were no significant changes in vital signs or report of unexpected clinical symptoms by any the subjects.

Conclusion: In this small cohort of subjects, there was no evidence of carbon dioxide retention or clinically significant changes in pH with prolonged use of N-95 masks.

35 Impact of COVID-19 on Surgical Cases Referred from the Emergency Department in a Tertiary County Hospital in the US

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Study Objectives: The onset of the COVID-19 pandemic has caused lower emergency department (ED) volume in the US and globally with many cities experiencing fewer patients seeking health care at hospitals. Initial low ED volumes were attributed to stay-at-home orders because of fear of contracting severe respiratory syndrome coronavirus 2 (SARS-CoV-2). The objective of this study is to assess whether these changes have affected the surgical burden at an urban tertiary county hospital emergency department. Several operating rooms (OR) were converted to COVID units to accommodate the increased COVID patient volume. Characterizing the surgical burden during the COVID pandemic will allow health care clinicians and hospitals to understand how to effectively utilize limited resources.

Methods: This is a retrospective review of patients who presented to a large county hospital emergency department and needed surgical intervention from December 10, 2019 until August 1, 2020. The patients were divided into 4 phases and were compared to control data from the previous year. Trauma cases were excluded. The following variables were used to assess for significant differences between the phases: weekly surgical volume, surgical type, and time to operating room. Chi-squared analysis was primarily utilized to compare data between phases.

Results: A total of 3636 study participants were included, with an additional 4765 patients from the control phase. During the COVID phase in 2020, surgical volume decreased as much as 48% in April as compared with the control phase in 2019 (Figure 1). Patients needing surgical intervention during the COVID phase had fewer comorbidities than those who presented in the pre-COVID phase. Across the 4 phases, this population had increasing percentages of OB/GYN cases (6.2%, 6.3%, 7.2%, 7.4% for Phases 1, 2, 3, 4 respectively).

Notably, there was an overall decrease in laparoscopic cholecystectomy (14.2%, 14.1%, 12.3%, 9.9%) cases. Significant differences in orthopedic (p = 0.008), podiatry (p = 0.015), and burn (p = 0.0009) cases were found during the COVID phases as compared to the control phases. The time to OR was also significantly less during the COVID phases than in the pre-COVID (p < 0.05) and control (p = 0.0024) phases.

Conclusion: There was a decrease in surgical volume during the COVID phase and improved time to OR. The increases in burns, podiatry, and orthopaedic cases during the pandemic may suggest an epidemiological change of injuries treated in the ED. Concerns have also been raised for domestic violence orthopedic-related injuries. Patients may have been less likely to seek care in the ED due to fear of contracting SARS-CoV-2. Anticipating the types of surgical cases and volume will help the hospital staff allocate resources more effectively for similar events in the future.

36 Emergency Department Visits for Pulmonary Embolism and Deep Venous Thrombosis After the Arrival of COVID-19

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Study Objectives: COVID-19 infection has been shown to be associated with increased numbers of pulmonary embolisms (PE) and deep venous thromboses (DVT). COVID-19 arrived in the New York City area in early March 2020. We hypothesized
that the number of ED patients diagnosed with PEs and DVTs increased after the arrival of COVID-19. Methods: Design: Retrospective cohort. Setting: EDs of 28 hospitals within 150 miles of New York City. Hospitals were teaching or non-teaching and rural, suburban or urban. Annual ED volumes were from 12, 000 to 122, 000. Population: Consecutive patients seen by ED physicians from March through November in 2019 and 2020, as COVID-19 arrived in this region in early March. Data analysis: We tallied the number of patients diagnosed with PEs and DVTs using International Classification of Disease (version 10) codes. We computed the changes in visits from 2019 to 2020. We used chi-square to test for statistical significance, with alpha set at 0.025 using the Bonferroni correction for multiple comparisons.

Results: The database contained a total of 1, 975, 332 visits, 1, 161, 080 in 2019 and 814, 252 in 2020 (a 30% decrease from 2019 to 2020). There were 3, 552 and 2, 529 patients diagnosed with PE and DVT respectively. The median age [interquartile range] and the percent female for PE and DVT were: 62 [48-72] and 62 [49-74]; 52% and 50% respectively. The number of visits for PE from March through November in 2019 and 2020 were 1, 349 and 1, 180, respectively. For DVTs these numbers were 1, 977 and 1, 575. Thus, visits for PE and DVT decreased from 2019 to 2020 by 20% and 13% respectively (p < 0.001).

Conclusion: Contrary to our hypothesis, we found that after the arrival of COVID-19 in the New York City area, visits for PEs and DVTs did not increase. We speculate that ED visits in 2020 decreased due to public fears of exposure to COVID-19 infection during hospital visits. Furthermore, testing for diagnosis of PE and DVT was often deferred because of the challenges in performing these studies on patients under investigation for COVID-19 infection. These factors could explain the decrease in number of PE and DVT cases that we found, despite the possible increased incidence of these conditions in the population.

37 The Impact of the Coronavirus (COVID-19) Pandemic on Access to Care and Basic Necessities of Emergency Department Patients With Opioid Use Disorders Who Are Linked to Treatment

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Study Objective: COVID-19 has immensely impacted access to medical care for marginalized people, including people with substance use disorders. A needs assessment survey was created to assess the needs of patients enrolled in our emergency department’s (ED’s) peer navigator care linkage program for patients with opioid use disorder during COVID-19. The navigator program is a team of peer and student navigators at our ED that coordinates care for patients with opioid use disorder, to provide them with social support and links them to medications for opioid use disorder. We retrospectively reviewed the responses to the needs assessment survey to better understand the implications of COVID-19 on access to medical care and basic necessities for this vulnerable population.

Methods: This was an IRB-approved, retrospective review of survey responses collected from April 2020 until April 2021. Patients were enrolled in our departmental peer navigator program as they presented to the ED with opioid-related complications (such as opioid overdose); the program started within the last two years. The survey consisted of questions that addressed how the pandemic impacted their ability to access medical care, inclination to seek medical care, and access to basic necessities such as housing and food. Participation was voluntary and the survey was administered by phone by the peer navigators and student volunteers. All survey responses were summarized using descriptive statistics.

Results: A total 181 patients were contacted, 69 of whom responded (38.1%). During the pandemic, 27.5% of respondents did not feel comfortable going to the ED for medical or psychiatric care, 21.7% had no alternative care site, and 20.3% were unable to access other addiction treatment services. Although telehealth was an alternative, 39.1% of the subjects did not have access to an appropriate device (eg, smartphone) and 37.7% did not have reliable internet access. During the pandemic, 33.3% (23) of respondents lost employment, and of that population, only 47.8% (11) qualified for unemployment assistance. Meals were often skipped by 20.1% of respondents and 42.0% reported not living in stable housing.

Conclusion: This survey illuminates the barriers to medical care and basic necessities for our substance using patient population, many of which may have been present before the COVID-19 pandemic. The results provide direction for resource allocation both currently and in the future. For example, to assist those who were unable to participate in a telehealth appointment, we are considering expansion of an existing program to provide patients with internet-capable cell phones. Future research should explore which interventions are most effective under similar circumstances.

38 Risk Factors of Sepsis Among Patients With qSOFA<2 in the Emergency Department

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Study Objective: There have been concerns that some patients with sepsis—life-threatening organ dysfunction caused by a dysregulated host response to infection—may be overdiagnosed with a quick Sequential Organ Failure Assessment (qSOFA)≥2 in the emergency department (ED). Despite this, little is known about the risk factors associated with sepsis among patients with qSOFA<2 in the ED.

Methods: This is a retrospective cohort study using ED data from a large tertiary medical center in Japan 2018-2020. We included adult patients (aged ≥18 years) presenting to the ED with suspected infection (eg, having a fever) and qSOFA<2. The primary outcome was the diagnosis of sepsis based on the Sepsis-3 criteria (defined as septic patients). We compared patient characteristics (eg, demographics, vital signs upon the initial triage, chief complaint, and comorbidities) between septic and non-septic patients. Additionally, we identified the potential risk factors of sepsis among patients with qSOFA<2 using a multivariable logistic regression model.

Results: We identified 151 (7%) septic patients among 2, 025 adult patients with suspected infection and qSOFA<2. Compared with non-septic patients, septic patients were likely to be older and have vital signs suggestive of imminent sepsis (eg, high respiratory rate). In the multivariable logistic regression model, the potential risk factors of sepsis among patients with qSOFA<2 were older age (adjusted OR, 1.92 [95% CI 1.19-3.19]), vital signs suggestive of imminent sepsis (eg, adjusted OR of altered mental status, 3.50 [95% CI 2.25-5.50]), receipt of oxygen therapy upon arrival at the ED (adjusted OR, 1.91 [95% CI 1.38-2.61]), chief complaint of sore throat (adjusted OR, 2.15 [95% CI 1.08-4.13]), and the presence of comorbid diabetes mellitus, ischemic heart disease, and chronic kidney disease (eg, adjusted OR of diabetes mellitus, 1.47 [95% CI 1.10-1.96]). On the contrary, high systolic blood pressure, and chief complaint of abdominal and chest pain were associated with a lower risk of sepsis (eg, adjusted OR of abdominal pain, 0.26 [95% CI 0.14-0.45]).

Conclusions: We found that older age, vital signs prognosticating sepsis, and the presence of some comorbidities were the potential risk factors of sepsis in patients with qSOFA<2. To prevent missed diagnoses of sepsis, we should treat patients with these potential risk factors more cautiously.

| Variables | Adjusted OR (95% CI) |
|-----------|---------------------|
| Sepsis     |                     |
| Male       | 0.49 (0.00-1.24)    |
| Age (21-35 years) | 1.92 (1.19-3.19)  |
| ≥65 years  | 2.80 (1.33-5.86)    |
| Vital signs |                     |
| Systolic blood pressure (mmHg) | 0.93 (0.50-1.75) |
| Heart rate (BPM) | 1.04 (0.90-1.21)  |
| Respiratory rate (RR) | 1.03 (1.01-1.06)  |
| Body temperature (°C) | 1.17 (1.03-1.31)  |
| Altered mental status | 3.50 (2.25-5.50)  |
| qSOFA<2 (%) | 1.04 (0.81-1.37)   |
| Treatment   |                     |
| Receipt of oxygen therapy upon ED arrival | 1.91 (1.13-2.64) |
| Chief complaints | 0.56 (0.14-1.43)  |
| Abdominal pain | 1.48 (0.69-2.92)  |
| Sore throat | 2.53 (1.28-7.43)   |
| Selected somaticlities | 0.99 (0.77-1.36)  |
| Hypertension | 1.32 (1.01-1.74)  |
| Diabetes mellitus | 1.39 (0.97-1.94)  |
| Chronic kidney disease | 2.21 (1.21-4.01) |