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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 N-95 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.

PCO2

Time at BVG draw(minutes)	N	PCO2			
		Mean	Std Dev	Minimum	Maximum
0	10	48.900	3.985	44.000	56.000
20	10	46.200	3.490	42.000	53.000
40	10	47.900	3.784	43.000	54.000
60	10	48.500	5.061	39.000	57.000

P=0.200

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.

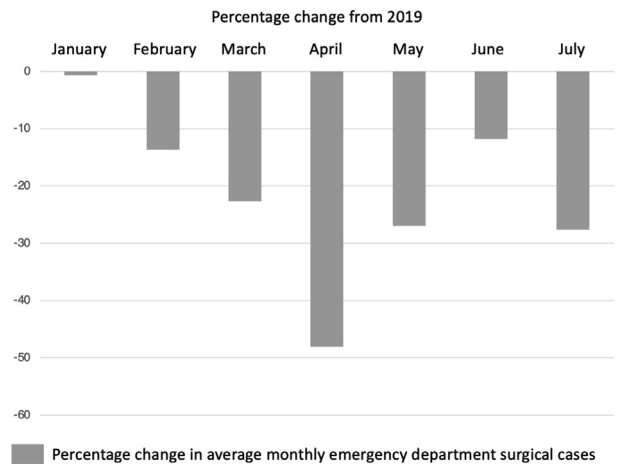


Figure 1. Comparison of emergency department surgical cases from January to July in 2019 and 2020

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

