Develop - DeVos Cardiovascular Research Program's Emergency Letter on the Pandemic

Scientific Stream Update on the COVID-19 Pandemic - 4.2.20 1000

Dyspnea Most Common Symptom and 1/3 of the Patients Have Cardiomyopathy Among the ICU Admitted COVID-19 Patients in State of Washington

Article Title: *Characteristics and Outcomes of 21 Critically Ill Patients With COVID-19 in Washington State*

Source: *JAMA*

Clinical Field: *Critical Care*

Article Type: *Clinical Report*

Study Type: *Retrospective Study*

Patient Group: *Severe COVID-19*

Intervention: *None*

Reviewer	*Ravi Kanth Velagapudi*
Study Design	*N/A*
Study Design Concerns	*Descriptive and observational study. Patients admitted to ICU in a single center.*
Main Results	*Total patients: 21, Mean age=70 years, 86% had comorbidities. Comorbidities and their prevalence in COVID 19 patients is as follows:* *CKD= 10/21 (47.6%), CHF 9/21 (42.9%), Diabetes 7/21 (33.3%), COPD 7/21 (33.3%).* *Admission Symptoms:* *cough 11/21 (47%), Shortness of breath 17/21 (76%), Fever 11/21 (52.4%).* *Treatment Measures:* *Mechanical ventilation 15/21 (71%), NIPPV 4/21 (19%), Use of vasopressors 14/21 (67%).* *Outcomes:* *AKI 4/21 (19.1%), Cardiomyopathy 7/21 (33.3%), Acute hepatic injury 3/21 (14.3%), Death 11/21 (52%).*
Comments	*This is an observational study of patients admitted to ICU with COVID 19.*

	Take home points from this study: *1. Fever was noted in only around 50% of the patients.* *2. About 1/3 rd of the patients developed new onset cardiomyopathy.* *3. Although most patients did not present with shock, vasopressors were used in 2/3 rd of the patients.* *Limitations:* *Small, observational study, single center study.* *Most patients are from nursing home and may not reflect the general population.*

Anti-HIV Drugs Not Efficient in Treating COVID-19

Article Information

Article Title: *A Trial of Lopinavir-Ritonavir in Adults Hospitalized with Severe Covid-19*

Source: *New Eng J Med*

Clinical Field: *Pulmonology*

Article Type: *Clinical Study*

Study Type: *Proper RCT*

Patient Group: *Covid-19, and an oxygen saturation (Sao2) of 94% or less while they were breathing ambient air or a ratio of the partial pressure of oxygen (Pao2) to the fraction of inspired oxygen (Fio2) of less than 300 mm Hg*

Intervention: *Open Label, Randomized*

Reviewer	*Ravi Kanth Velagapudi*
Study Design	*Minor concerns*

Study Design Concerns	*Randomly assigned in a 1:1 ratio to receive either lopinavir+ritonavir (400 mg and 100 mg, orally) twice daily, plus standard care, or standard care alone, for 14 days. n=100 control n=99 treatment* *Minor limitations:* *Study is open labeled.* *Placebo was not used in the controlled arm.*
Main Results	*Primary Outcome: Time to clinical improvement was not significantly different in both arms. Time to clinical improvement was shorter (8 vs 13 days) in a sub group of patients in intervention group if Lopinavir+Ritonaivr was started < 12 days from the onset of clinical symptoms.* *HR clin improvement with treatment 1.24 [0.9;1.72]. Mortality treatment vs standard care 19.2% vs 25% with -5.8 percentage points [-17.3;5.7]. No significant differences.* *Secondary outcomes:* *lower 28 day mortality, Shorter ICU stay, and shorter duration to hospital discharge.* *No change in the viral loads over the treatment time.* *There were 4 serious gastrointestinal adverse events in the lopinavir-ritonavir group but none in the standard-care group; all 4 events were related to the trial medication.*

Comments	*Study was powered to find significant difference in time to clinical improvement between the 2 groups.* *There is no significant difference between the two groups in the time to clinical improvement.*

cTroponin I as a sign of cardiac injury a marker of risk for ICU and Death in COVID-19 patients

Article Title: *Cardiovascular Considerations for Patients, Health Care Workers, and Health Systems During the Coronavirus Disease 2019 (COVID-19) Pandemic*

Source: *JACC*

Clinical Field: *Cardiology*

Article Type: *Other*

Study Type: *Other*

Patient Group: _____

Intervention: *N/A*

Reviewer	*Disha Geriani*
Study Design	*N/A*
Study Design Concerns	*Peer-reviewed and pre-print literature (pubmed as well on MEDRXIV) pertaining to CV outcomes in COVID-19 patients*
Main Results	*-Those with COVID-19 and pre-existing cardiovascular disease (CVD) have increased risk of severe infection and death* *- Cardiac injury (Troponin I elevation) more common in ICE admitted COVID-19 than non- ICU (22.2% vs 2.0%, p<0.001) and those who died vs survivors (59% vs 1%, p<0.001)* *- COVID-19 patients heart failure was observed in 23.0% os cases and 51.9% of those that dies while it was noted in 11.7% among those who survived.* *-COVID-19 is associated with multiple direct and indirect cardiovascular complications like acute myocardial injury, myocarditis, arrhythmias and venous thromboembolisms* *-Therapies under investigation for COVID-19 may have direct cardiovascular toxicities or indirectly interact with medications being used in patients with CVD* *-Provision of CV care may place health care workers in a position of vulnerability as they become host or vectors of disease transmission*
Comments	*-Prevalent CVD may be a marker of accelerated immunologic aging/dysregulation which may indirectly relate to poor prognosis in COVID-19* *-Higher expression of ACE2 in patients with HTN and CVD are postulated for enhanced susceptibility to SARS-CoV2* *-Patients may present with myocarditis and ACS, which may be a direct effect of the infection or indirect in the setting of stress ischemia in ARDS from COVID-2* *-Cardiac arrhythmias may be related to metabolic disarray,*

	hypoxia or inflammatory stress in patients with or without prior CVD *-New onset of malignant tachyarrhythmias should raise suspicion for underlying myocarditis* *-Cardiogenic shock, heart failure and VTE are other complications related to COVID-19 patients with existing CVD* *-Given that cardiac ICUs may be converted into medical ICUs as a preparation for hospital surges for COVID-19 patients, the decision to pursue medical management or percutaneous interventional approaches rather than coronary artery bypass grafting or surgery may have to be undertaken after risk-stratifying these patients*

European CDC Recommendations on Disinfection Against SARS-CoV-2

Article Title: *Disinfection of environments in healthcare and nonhealthcare settings potentially contaminated with SARS-CoV-2*

Source: *ECDC Technical Report March 2020*

Clinical Field: *Other*

Article Type: *National Document*

Study Type: *Other*

Patient Group: *N/A*

Intervention: *N/A*

Reviewer	*Meredith Busman*
Study Design	*Well Designed*
Study Design Concerns	_____
Main Results	*This is a review of disinfection methods based on current literature. It is highly applicable because it details the different cleaning procedures and precautions for high and low risk healthcare settings, as well as in personal and public spaces. The findings can be used to create a set of standardized, evidence-based guidelines for cleaning and disinfection of facilities based on exposure type.* *SARS-CoV-2 detectable in* *- the air after three hours* *four hours on copper* *- 24 hours on cardoard* *- three days on plastic and steel* *Findings for the inpatient healthcare setting can be summarized as follows:* *- Spaces where an aerosolizing procedure has been performed should be ventilated with fresh air or a HEPA filtration system for 1-3 hours before cleaning. If no aerolozing procedure has been performed, cleaning may take place on a more expedient basis.* *- Hard surfaces should be cleaned with a neutral detergent, then decontaminated with either a marked virucidal cleaning agent; a solution with 0.05% sodium hypochlorite; or a solution with at least 70% ethanol.* *- Linens should be washed in a hot water cycle and regular detergent.* *- Disposable cleaning equipment such as single use towels is recommended, but rags can be reused after soaking in a 0.1% sodium hypochlorite solution.* *- Environmental service workers should wear PPE, including gloves, surgical mask (or N95), and full length disposable gown.*

	(Please see separate table in article for complete set of recommendations).
Comments	*Although SARS-CoV-2 is presumed to be mostly transmitted through direct inhalation of large respiratory droplets, contact with fomites is also widely considered to be a mode of transmission. Fecal-oral, blood borne and airborne mode has also been suggested, but considered significantly less likely.*

Mean Incubation Period for SARS-CoV-2 5.1 Days, If Symptoms Develop

Article Title: ***The Incubation Period of Coronavirus Disease 2019 (COVID-19) From Publicly Reported***

Confirmed Cases: Estimation and Application

Source: *Annals of Internal Medicine*

Clinical Field: *Infectious Disease*

Article Type: _____

Study Type: *Retrospective Study*

Patient Group: *CVOVID-19 positive patients of different severity*

Intervention: *N/A*

Reviewer	*Kathrine A. Kelly-Schuette*
Study Design	*Minor concerns*
Study Design Concerns	*The data is from news/press reports and public health reports.* *Small sample size.* *Some uncertainty with the intervals of exposure to symptoms onset.* *Multiple defined timeframes for exposure to symptoms; including earliest arrival to Wuhan, maximum interval from exposure, upper limit of exposure interval, or Dec 1st if exposure could not be determined.*
Main Results	*181 patients with confirmed cases of COVID, outside Hubei province. Cases were searched for time of exposure to any symptom onset.* *The median incubation period was 5.1 days and 97.5% of cases developed symptoms within 11.5 days (CI 8.2-15.7days)* *Symptom onset to hospitalization was 1.2 days* *Approximately 101 out of 10,000 cases will develop symptoms after 14 days of active monitoring.*
Comments	*This work, by using symptoms as the outcome, doesn't address the problem of asymptomatic cases and transmission before signs of symptoms. The timeframe of incubation is consistent with other reports (5 days, 5.2 days) and interestingly similar to other coronavirus: SARS and MERS (5-7days and 5-7 days, respectively). Incubation does not equate to infectiousness, which has important implications for transmission.* *Strengths: the authors controlled for bias of mild symptoms (*

	cough/sore throat) by performing the same analysis on patients from the known time of fever onset and found median incubation period of 5.7days (4.9-6.8days). *Similar analysis was done for patients exposed inside and outside mainland China.* *Interesting findings: using the incubation period, the predicted number of missed symptomatic infections with active monitoring for 7 days is 21.1/10,000 high-risk persons. However, at 14 days it is unlikely that symptomatic infections would be missed (1/10,000), but the estimate shows 101/10,000 infected may develop symptoms after 14 days. The model assumes constant risk of infection during study timeframe (12/2019-1/2019)* *Current recommendations for active monitoring after infection is 14 days, is that long enough given the model predicting that 101/10,000 will develop symptoms after 14 days?* *Extended monitoring may be justified in extreme cases (ie. healthcare worker exposed to COVID19) by taking into account the cost of quarantine and cost of failing to identify a symptomatic case of COVID19.* *Funded by US CDC and NIH Allergy and Infectious Diseases and Alexander von Humboldt Foundation*

High Proportion of Children Are Asymptomatic Including Not Having Fever With SARS-CoV-2 Infection

Article Title: *SARS-CoV-2 Infection in Children*

Source: *New Eng J Med 2020*

Clinical Field: *Other*

Article Type: *Other*

Study Type: *Retrospective Study*

Patient Group: *Children under 16 years of age*

Intervention: *N/A*

Reviewer	*Eric Kort*
Study Design	*Major Concerns*
Study Design Concerns	*The same challenges that confront epidemiologic analysis of COVID-19 in adults are present here. While this study is from the only hospital that was assigned to treat children affected by COVID-19, it is unclear how many children with mild or no symptoms were missed. Presumably, most children with significant symptoms came to the attention of the health care system, although given the heterogeneity of symptoms and findings documented here, it is likely a substantial number of cases were missed. The study used throat and nasopharyngeal swabs. The sensitivity of these assays is not clear, but may be as low as 35-65% (doi:10.1001/jama.2020.3786)*
Main Results	*n=171* *1391 children under 16 years of age were tested for COVID-19 (which is about 700 per million population under 16 years of age). Out of these 171 tested positive for COVID-19. 12.3% were COVID-19 positive. Age distribution of the positive cases was was fairly homogenous, with the lowest proportion being those < 1 year of age. There was a predilection for male patients. 16% were asymptomatic. Cough, pharyngeal erythema, and fever were each present in roughly half of cases. Pneumonia was the most common diagnosis. About 60% had abnormal chest CT. 15.8% had neither symptoms nor abnormal chest imaging. 67% never had a temperature about 38.0C during their hospitalization. No child without pre-existing/co-existing conditions required ICU care. There was a single death, in a 10 month old child.*
Comments	*The presentation of COVID-19 in children in this city seems similar to adults in terms of clinical and imaging findings. Notably one in six had no symptoms and normal imaging. Also notable is that the majority were afebrile at presentation, and two thirds were fever free during their hospitalization.*

Prone Positioning Improves Alveolar Recruitment, Even In ECMO Patients

Article Title: *Lung Recruitability in SARS-CoV-2 Associated Acute Respiratory Distress Syndrome: A Single-center, Observational Study*

Source: *Am J Crit Care Med*

Clinical Field: *Critical Care*

Article Type: *Clinical Report*

Study Type: *Retrospective Study*

Patient Group: *Severe COVID-19*

Intervention: *Prone position*

Reviewer	*Ambaris Singh, MD*
Study Design	*Minor concerns*
Study Design Concerns	*-Sample size small (n=12) and not randomized* *-Patients in study received various days of noninvasive and invasive ventilatory support prior to 1st day of observation in study*
Main Results	*-7 patients received at least one session of prone positioning, 3 received both prone and ECMO, 3 died.* *-10/12 poorly recruitable on day 1 of observation* *-Patients who did not receive prone positioning had persistently poor recruitability (16/17 measurements)* *-Alternating between supine and prone position associated with increased lung recruitability (13/36 measurements)*
Comments	*-Improvement in oxygenation at prone positioning not statistically significant but seemed to be clinically relevant.*

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