The Daily COVID-19 Literature Surveillance Summary

September 14, 2020

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COVID-19 Daily Literature Surveillance

COVID19LST

Bringing you real time, distilled information for guiding best practices during the COVID-19 pandemic

LEVEL OF EVIDENCE

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence

Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards**	Case-control studies, or "poor or non-independent reference standard**	Mechanism-based reasoning
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial*	Case-series or case-control studies, or poor quality prognostic cohort study**	n/a
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or *n*-of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study**	Case-series, case-control studies, or historically controlled studies**	Mechanism-based reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, *n*-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or *n*-of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect			
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized trial	Non -randomized controlled cohort/follow-up study**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning

*** Level may be graded down on the basis of study quality, imprecision, indirectness (study PICO does not match questions PICO), because of inconsistency between studies, or because the absolute effect size is very small; Level may be graded up if there is a large or very large effect size.**

**** As always, a systematic review is generally better than an individual study.**

How to cite the Levels of Evidence Table

OCEBM Levels of Evidence Working Group*. "The Oxford 2011 Levels of Evidence".
Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o=5653

** OCEBM Table of Evidence Working Group = Jeremy Howick, Iain Chalmers (James Lind Library), Paul Glasziou, Trish Greenhalgh, Carl Heneghan, Alessandro Liberati, Ivan Moschetti, Bob Phillips, Hazel Thornton, Olive Goddard and Mary Hodgkinson*

EXECUTIVE SUMMARY

Climate

- Analysis of a cross-sectional, self-reported survey of 10,624 Internet users revealed that 17% of survey participants used telehealth due to the pandemic with Blacks, Latinos, and those identified with other races having statistically significant higher odds than White participants. The authors urge the need for social change to combat systemic racism, especially in the setting of the COVID-19 pandemic, and call for better access and adaptation to telehealth for all races, ethnicities, and socioeconomic groups.

- Anthropologists from Austria and Pakistan offer multiple reasons why COVID-19 may overwhelm low-income countries, using Pakistan as an example. The authors discuss risk factors such as economic disparities, lack of sanitation facilities, and distrust towards governmental actions, and outline how such factors will hinder the recovery process of struggling countries.

Epidemiology

- A retrospective study in New Jersey compared patients admitted from March 1-14, 2020 (control group) to patients admitted March 18-31, 2020 (COVID-era group) and found that the number of trauma admissions decreased by 44.9% in the COVID-era group, with length of stay and injury severity scores being significantly reduced in the COVID-era group. The COVID-era group had fewer falls and motor vehicle collision patients, but more self-inflicted injuries suggesting that stay at home orders implemented to reduce the transmission of COVID-19 resulted in less severe and fewer numbers of trauma injuries, but may have increased psychological stress in the population.

- A retrospective cohort study of 496 COVID-19 patients in Singapore found clinical features including anosmia and dysgeusia were more predictive of COVID-19 cases among patients with acute respiratory illness compared to abnormalities in laboratory results and radiographic images.

Transmission & Prevention

- A news article by The Journal of the American Medical Association (JAMA) discusses COVID-19 vaccine development, highlighting advances in mRNA vaccines from SARS-CoV-2 RNA sequencing with benefits including ease of laboratory production without growth in eggs or cell lines, making large scale development and manufacturing more feasible. Authors suggest that a functional COVID-19 mRNA vaccine may be a viable option for commercial production and could aid in advancement of vaccines for other diseases such as human immunodeficiency virus (HIV), herpes simplex virus (HSV), and influenza.

- Infectious Disease doctors at the University of California, San Francisco hypothesize that universal facial masking may reduce the severity of COVID-19 disease in addition to preventing transmission. Specifically, the authors hypothesize that mask-wearing may increase the proportion of infected people remaining asymptomatic by reducing the viral inoculum to which mask-wearers are exposed. The authors suggest that increasing the proportion of mild or asymptomatic SARS-CoV-2 can result in strong cell-mediated immunity, highlighting the role of universal masking in controlling the COVID-19 pandemic.

Adjusting Practice During COVID-19

- Retrospective review from the Journal of Knee Surgery evaluated the enhanced recovery after surgery (ERAS) protocol which sought to reduce length of hospital stay and complications for post-operative patients. When comparing cases of knee arthroplasties from the last quarter of 2019 (199 cases) to that of the first quarter in 2020 (76 cases), patients during the COVID-19 outbreak had shorter lengths of inpatient stay without significant changes to the complication or readmission rates.

TABLE OF CONTENTS

RACIAL AND ETHNIC DIFFERENCES IN SELF-REPORTED TELEHEALTH USE DURING THE COVID-19 PANDEMIC: A SECONDARY ANALYSIS OF A U.S. SURVEY OF INTERNET USERS FROM LATE MARCH

Campos-Castillo C, Anthony D.. J Am Med Inform Assoc. 2020 Sep 7:ocaa221. doi: 10.1093/jamia/ocaa221. Online ahead of print.
Level of Evidence: 1 - Local and current random sample surveys (or censuses)

BLUF

Investigators affiliated with University of Wisconsin-Milwaukee and University of Michigan performed a secondary analysis of a cross-sectional, self-reported survey by Pew Research Center of 10,624 Internet users between March 19-24, 2020. The results revealed that 17% of survey participants used telehealth due to the pandemic with Blacks, Latinos, and those identified with other race having statistically significant higher odds than White participants. The authors urge the need for social change to combat systemic racism, especially in the setting of the COVID-19 pandemic, and call for better access and adaptation to telehealth for all races, ethnicities, and socioeconomic groups.

SUMMARY

The goal of this analysis was to investigate systemic racial and ethnic disparities in telehealth utilization during the early period of the pandemic. Estimates were based on measuring respondents' socioeconomic characteristics (Figure 1). Additionally, the estimated racial and ethnic differences variation across different levels of perceived threat of the pandemic were evaluated (Figure 2).

ABSTRACT

OBJECTIVE: Widespread technological changes, like the rapid uptake of telehealth in the U.S. during the COVID-19 pandemic, risk creating or widening racial/ethnic disparities. We conducted a secondary analysis of a cross-sectional, nationally representative survey of Internet users to evaluate whether there were racial/ethnic disparities in self-reported telehealth use early in the pandemic. MATERIALS AND METHODS: The Pew Research Center fielded the survey March 19-24, 2020. Telehealth use because of the pandemic was measured by asking whether respondents (N = 10,624) "used the internet or email to connect with doctors or other medical professionals as a result of the coronavirus outbreak." We conducted survey-weighted logistic regressions, adjusting for respondents' socioeconomic characteristics and perceived threat of the pandemic to their own health (no threat, minor, major). RESULTS: Approximately 17% of respondents reported using telehealth because of the pandemic, with significantly higher unadjusted odds among Blacks, Latinos, and those identified with other race compared to White respondents. The multivariable logistic regressions and sensitivity analyses show Black respondents were more likely than Whites to report using telehealth because of the pandemic, particularly when perceiving the pandemic as a minor threat to their own health. DISCUSSION: Black respondents are most likely to report using telehealth because of the COVID-19 pandemic, particularly when they perceive the pandemic as a minor health threat. CONCLUSION: The systemic racism creating health and health care disparities has likely raised the need for telehealth among Black patients during the pandemic. Findings suggest opportunities to leverage a broadly defined set of telehealth tools to reduce health care disparities post-pandemic.

FIGURES

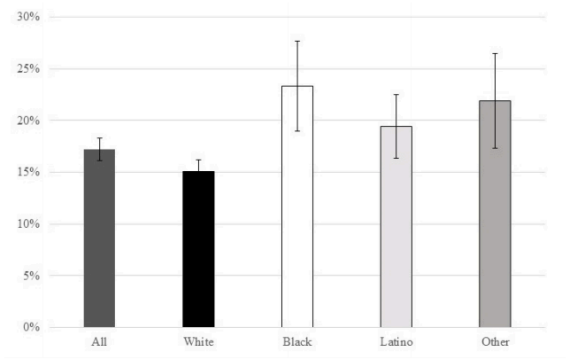

Figure 1. Survey-weighted percentage with 95% confidence intervals of U.S. adults reporting telehealth use due to the COVID-19 pandemic by race and ethnicity.

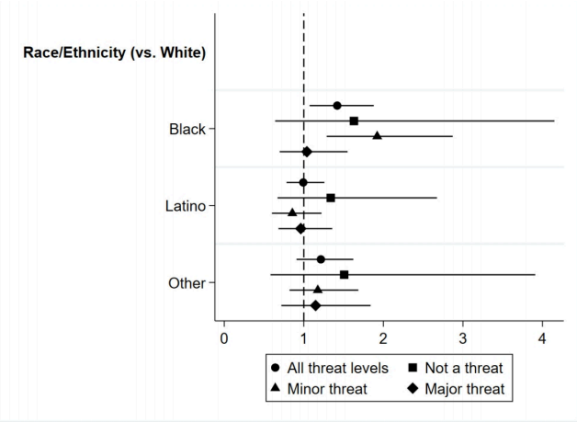

Figure 2. Adjusted odds ratios with 95% confidence intervals for reported telehealth use due to COVID-19 pandemic by perceived threat level.

WHY MAY COVID-19 OVERWHELM LOW-INCOME COUNTRIES LIKE PAKISTAN?

Ali I, Ali S.. Disaster Med Public Health Prep. 2020 Sep 10:1-11. doi: 10.1017/dmp.2020.329. Online ahead of print.
Level of Evidence: Other - Expert Opinion

BLUF

An expert opinion by two anthropologists from Austria and Pakistan offers multiple reasons why COVID-19 may overwhelm low-income countries, using Pakistan as an example. The authors discuss risk factors such as economic disparities, lack of sanitation facilities, and distrust towards governmental actions,and outline how such factors will hinder the recovery process of struggling countries. The authors ultimately advocate for short term policies (e.g. improving hand hygiene) and long-term policies (e.g. correcting social inequities) to support low-income countries in the face of the pandemic.

THE IMPACT OF THE COVID-19 PANDEMIC ON HOSPITAL ADMISSIONS FOR TRAUMA AND ACUTE CARE SURGERY

DiFazio LT, Curran T, Bilaniuk JW, Adams JM, Durling-Grover R, Kong K, Nemeth ZH.. Am Surg. 2020 Sep 10:3134820939904. doi: 10.1177/0003134820939904. Online ahead of print.
Level of Evidence: 3 - Local non-random sample

BLUF

A retrospective two-cohort study conducted by the surgery department at Morristown Medical Center in New Jersey compared patients admitted from March 1-14, 2020 (control group) to patients admitted March 18-31, 2020 (COVID-era group) and found that the number of trauma admissions decreased by 44.9% in the COVID-era group, with length of stay and injury severity scores (Figure 1) being significantly reduced in the COVID-era group (p=0.0088 and p=0.0314 respectively). The COVID-era group had fewer falls and motor vehicle collision patients, but more self-inflicted injuries (Table 1), suggesting that stay at home orders implemented to reduce the transmission of COVID-19 resulted in less severe and fewer numbers of trauma injuries, but may have increased psychological stress in the population.

FIGURES

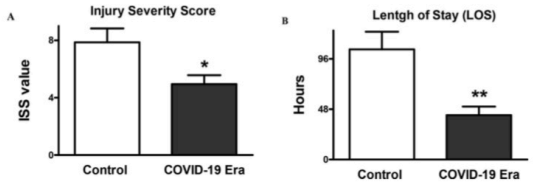

Figure 1 Statistical comparison of (A) injury severity score (ISS) and (B) length of stay of all patients admitted to the trauma center in the control or the COVID-19 era cohort. Statistical analysis was done using the 2-tailed Student's t-test, and data are expressed as means ± SEM, *P < .05, **P < .01 versus control.

Table 1. Comparison of Injury-Related Clinical Data for All Patients Admitted to the Trauma Center for Both the Control a the COVID-19 Era Groups.

	Control	COVID-19 era	% Change
Total cases	69	38	44.9% ↓
Average age (years)	63.6	61.9	2.6% ↓
Average injury severity score	7.87	4.94	37.2% ↓
Average length of stay (hours)	105.00	42.28	59.7% ↓
Mechanism of injury			
Fall	38	27	28.9% ↓
Motor vehicle collision	20	5	75.0% ↓
Struck by object	3	0	↓↓↓
Self-inflicted	**0**	**2**	↑↑↑

A COMPARATIVE STUDY ON THE CLINICAL FEATURES OF COVID-19 WITH NON-SARS-COV-2 RESPIRATORY VIRAL INFECTIONS

Tan JY, Sim XYJ, Liang En W, Chua YY, Cherng BPZ, Ng IM, Conceicao EP, Wong TJ, Yang Y, Aung MK, Ling ML, Venkatachalam I.. J Med Virol. 2020 Sep 3. doi: 10.1002/jmv.26486. Online ahead of print.
Level of Evidence: 3 - Non -randomized controlled cohort/follow-up study

BLUF

A retrospective cohort study conducted at Singapore General Hospital from January 17 to April 15, 2020 by internal medicine and infectious disease specialists found clinical features including anosmia and dysgeusia were more predictive of COVID-19 cases (n=287/496; confirmed via RT-PCR) among patients with acute respiratory illness (Tables 1,2) compared to abnormalities in laboratory results and radiographic images (Table 3). Authors highlight the importance of clinical features in early COVID-19 detection, which supports effective risk stratification and resource utilization.

SUMMARY

Additional study findings include:
1. The COVID-19 group contained a greater proportion of males and Indian individuals ($p<0.001$; Table 2).
2. COVID-19 patients were more likely to have fever, myalgias, anosmia and/or dysgeusia but less likely to have upper respiratory symptoms compared to non-SARS-CoV-2 respiratory virus patients (Table 3).
3. There was no significant difference in abnormal lung findings on chest x-ray between the COVID-19 and non-SARS-CoV-2 respiratory virus groups.

ABSTRACT

During this COVID-19 pandemic, physicians have the important task of risk stratifying patients who present with acute respiratory illnesses. Clinical presentation of COVID-19, however, can be difficult to distinguish from other respiratory viral infections. Thus, identifying clinical features that are strongly associated with COVID-19 in comparison to other respiratory viruses can aid risk stratification and testing prioritization especially in situations where resources for virological testing and resources for isolation facilities are limited. In our retrospective cohort study comparing clinical presentation of COVID-19 and other respiratory viral infections, we found that anosmia and dysgeusia were symptoms independently associated with COVID-19 and can be important differentiating symptoms in patients presenting with acute respiratory illness. On the other hand, laboratory abnormalities and radiological findings were not statistically different between the 2 groups. In comparing outcomes, patients with COVID-19 were more likely to need high dependency or intensive care unit care, and had longer median length of stay. With our findings, we emphasize that epidemiological risk factors and clinical symptoms are more useful than laboratory and radiological abnormalities in differentiating COVID-19 from other respiratory viral infections.

FIGURES

Viruses detected – No. (%)	COVID-19 (n=305)	Non-SARS-CoV-2 respiratory viruses (n=182)
Rhinovirus	5 (1.6)	76 (41.8)
Influenza A and B	0 (0)	47 (25.8)
Adenovirus	1 (0.3)	15 (8.2)
Human coronavirus 229E/NL63/OC43	1 (0.3)	17 (9.3)
Human enterovirus	0 (0)	3 (1.6)
Metapneumovirus	1 (0.3)	6 (3.3)
Parainfluenza 1-4	2 (0.7)	12 (6.6)
Respiratory Syncytial virus	0 (0)	6 (3.3)
Human Bocavirus 1-4	0 (0)	0 (0)

Table 1. Distribution of common respiratory viruses detected in both groups.

	COVID-19 (n=287)	Non-SARS-CoV-2 respiratory viruses (n=182)	p-values
Demographics			
Age – no. (%)			0.313
≤30 years old	93 (32.4)	69 (37.9)	
31 -60 years old	161 (56.1)	89 (48.9)	
>60 years old	33 (11.5)	24 (13.2)	
Gender – no.(%)			<0.001
Male	233 (81.2)	103 (56.60)	
Race – no.(%)			<0.001
Chinese	88 (30.7)	74 (40.7)	
Malay	10 (3.5)	31 (17.0)	
Indian	155 (54.0)	47 (25.8)	
Others	34 (11.8)	30 (16.50)	
Epidemiological features – no.(%)			
Exposure to possible Covid-19 positive case	155 (54.0)	84 (46.20)	0.097
Exposure to confirmed Covid-19 positive case	71 (24.7)	20 (11.0)	<0.001
Resides in foreign worker dormitory	148 (51.6)	31 (17.0)	<0.001
Positive contact with person with ARI symptoms	50 (17.4)	50 (27.50)	0.010
Comorbidities – no.(%)			
Hypertension	50 (17.4)	28 (15.4)	0.564
Hyperlipidemia	15 (5.2)	25 (13.7)	0.001
Diabetes Mellitus	15 (5.2)	23 (12.6)	0.004
Ischemic Heart Disease	6 (2.1)	13 (7.1)	0.007
Prior stroke	5 (1.7)	5 (2.7)	0.463
Renal disease	1 (0.3)	10 (5.5)	<0.001
Chronic lung disease	19 (6.6)	15 (8.2)	0.509
Liver disease	0 (0)	1 (0.5)	0.388
Active malignancy	0 (0)	2 (1.1)	0.150
Charlson Comorbidity index			0.044
0-2 points	269 (93.7)	161 (88.5)	
≥3 points	18 (6.3)	21 (11.5)	

Table 2. Demographics, epidemiological features and comorbidities of COVID-19 patients and patients with non-SARS-CoV-2 respiratory viruses.

	COVID-19 (n=287)	Non-SARS-CoV-2 respiratory viruses (n=182)	p-value
Clinical symptoms – no. (%)			
Fever	237 (82.6)	118 (64.8)	<0.001
Sore throat	99 (34.5)	109 (59.9)	<0.001
Cough	166 (57.8)	146 (80.2)	<0.001
Rhinorrhea/Congested nose	72 (25.1)	100 (54.9)	<0.001
Myalgia	69 (24.0)	19 (10.4)	<0.001
Ansomia and/or dysgeusia	53 (18.5)	3 (1.6)	<0.001
Gastrointestinal symptoms[a]	45 (15.7)	23 (12.6)	0.362
Presenting Vital signs – no. (%)			
Tachycardia >100bpm[b]	137 (47.7)	67 (36.8)	0.020
Laboratory values – no. (%)			
White cell count			
Leukopenia (<4.0 x10^9/L)	37 (12.9)	12 (6.6)	0.030
Leukocytosis (>10.0 x10^9/L)	12 (4.2)	45 (24.7)	<0.001
Differential Count			
Neutrophilia (>7.5 x10^9/L)	12 (4.2)	34 (18.7)	<0.001
Lymphopenia (<1.0 x10^9/L)	52 (18.1)	28 (15.4)	0.443
Monocytosis (>0.8 x10^9/L)	76 (26.5)	51 (28.0)	0.714
Platelet count			
Thrombocytopenia (<140 x10^9/L)	20 (7.0)	9 (4.9)	0.375
Lactate dehydrogenase (>454U/L)	79/284 (27.8)	37/107(34.6)	0.192
C-reactive peptide (>9.1mg/L)	79/193 (40.9)	40/74 (54.1)	0.054
Procalcitonin (>0.5ug/L)	17/115 (14.7)	6/92 (6.5)	0.049
Imaging no./total no. (%)			
Abnormal lung findings on chest x ray[c]	48/286 (16.8)	32/182 (17.6)	0.823
Unilateral vs bilateral	20/48 (41.7)	10/32 (31.3)	0.346

Abbreviations: bpm, beats per minute.

[a]Gastrointestinal symptoms include abdominal pain, nausea, vomiting diarrhea

[b]Taken as the highest heart rate during first 24 hours of admission

[c]Abnormal lung findings include reported haziness, air space opacities, ground glass changes, consolidation

Table 3. Clinical symptoms, laboratory and radiological findings of COVID-19 patients and patients with non-SARS-CoV-2 respiratory viruses.

UNDERSTANDING THE PATHOLOGY

A NET-THROMBOSIS AXIS IN COVID-19

Hidalgo A.. Blood. 2020 Sep 3;136(10):1118-1119. doi: 10.1182/blood.2020007951.
Level of Evidence: 5 - Expert Opinion

BLUF

A cardiovascular researcher responds to Middleton et al. (2020)'s finding that the neutrophils in COVID-19 patients are prone to releasing neutrophil extracellular traps (NETs), DNA-based complexes that are thrombogenic, potentially leading to COVID-19-related pulmonary dysfunction and death. In contrast to this study, the author suggests that the NET-thrombosis connection is more complex due to the imprecision of NETs in the plasma and lack of correlation between NETs and markers of endothelial damage or active thrombosis (ie., D-dimers or von Willebrand factor). The author suggests for further cohort studies on NETs in the involvement of COVID-19 pathology to identify strategies to better protect patients.

TRANSMISSION & PREVENTION

COVID-19: SECOND WAVE OR MULTIPLE PEAKS, NATURAL HERD IMMUNITY OR VACCINE-WE SHOULD BE PREPARED

Moghnieh R, Abdallah D, Bizri AR.. Disaster Med Public Health Prep. 2020 Sep 10:1-18. doi: 10.1017/dmp.2020.349. Online ahead of print.
Level of Evidence: Other - Guidelines and Recommendations

BLUF

An article published by infectious disease specialists from Lebanon outlines recommendations for physicians, public health agencies, and the general public to use in determining how to establish policies for a prolonged outbreak/second wave of COVID-19. These recommendations include maintaining control of patient comorbidities, taking daily vit-C, vit-D, and zinc supplements, ensuring upkeep with essential vaccines, and ensuring adequate budgeting and supplies at the hospital level to reduce the burden of COVID-19. Their recommendations stress the importance of rigorous implementation of infection control, antibiotic stewardship, and policy for the event of a resurgence of COVID-19 infection as we await vaccine development and acquisition of herd immunity.

DEVELOPMENTS IN TRANSMISSION & PREVENTION

COVID-19 AND MRNA VACCINES-FIRST LARGE TEST FOR A NEW APPROACH

Abbasi J.. JAMA. 2020 Sep 3. doi: 10.1001/jama.2020.16866. Online ahead of print.
Level of Evidence: Other - Opinion

BLUF

This news article by The Journal of the American Medical Association (JAMA) discusses COVID-19 vaccine development, highlighting advances in mRNA vaccines from SARS-CoV-2 RNA sequencing with benefits including ease of laboratory production without growth in eggs or cell lines, making large scale development and manufacturing more feasible. Authors suggest that a functional COVID-19 mRNA vaccine may be a viable option for commercial production and could aid in advancement of vaccines for other diseases such as human immunodeficiency virus (HIV), herpes simplex virus (HSV), and influenza.

PREVENTION IN THE COMMUNITY

FACIAL MASKING FOR COVID-19 - POTENTIAL FOR "VARIOLATION" AS WE AWAIT A VACCINE

Gandhi M, Rutherford GW.. N Engl J Med. 2020 Sep 8. doi: 10.1056/NEJMp2026913. Online ahead of print.
Level of Evidence: Other - Expert Opinion

BLUF

Physicians within the field of Infectious Disease at the University of California, San Francisco hypothesize that universal facial masking may reduce the severity of COVID-19 disease in addition to preventing transmission. Specifically, the authors hypothesize that mask-wearing may increase the proportion of infected people remaining asymptomatic by reducing the viral inoculum to which mask-wearers are exposed. The authors suggest that increasing the proportion of mild or asymptomatic SARS-CoV-2 can result in strong cell-mediated immunity, highlighting the role of universal masking in controlling the COVID-19 pandemic.

SUMMARY

The authors' suggestions for future research are outlined below:

- Future studies should compare the rate of asymptomatic infection in areas with and areas without universal masking.
- Future studies should compare the strength and durability of SARS-CoV-2–specific T-cell immunity between people with asymptomatic COVID-19 infection and those with symptomatic COVID-19 infection.
- Future studies should also investigate whether a natural slowing of SARS-CoV-2 spread in areas with a high proportion of asymptomatic infection is observed.

MANAGEMENT

ACUTE CARE

DEVELOPING AN ETHICS FRAMEWORK FOR ALLOCATING REMDESIVIR IN THE COVID-19 PANDEMIC

Lim S, DeBruin DA, Leider JP, Sederstrom N, Lynfield R, Baker JV, Kline S, Kesler S, Rizza S, Wu J, Sharp RR, Wolf SM..
Mayo Clin Proc. 2020 Sep;95(9):1946-1954. doi: 10.1016/j.mayocp.2020.06.016. Epub 2020 Jun 20.
Level of Evidence: Other - Guidelines and Recommendations

BLUF

Clinical researchers in association with the Minnesota Department of Health (MDH) and Minnesota COVID Ethics Collaborative (MCEC) created guidelines for ethically allocating remdesivir to facilities with COVID-19 positive patients and to specific COVID-19 positive patients receiving care in Minnesota (see summary; Text Boxes 2,3,4).

SUMMARY

Specific recommendations as follows:
- Allocate remdesivir supply to each facility based on the number of admitted COVID-19 positive patients who have not previously received remdesivir treatment (Text Box 2).
- Allocation among patients directed by the likelihood of patient recovery with use of remdesivir and the likelihood of individual negative outcomes without use of remdesivir (Text Box 3).
- Triage teams within each facility should direct the allocation process and decisions should be clearly documented in each patient's electronic health record as well as a facility log for all decisions (Text Box 4).

ABSTRACT

On May 1, 2020, the US Food and Drug Administration (FDA) issued an Emergency Use Authorization (EUA) to allow use of the antiviral drug remdesivir to treat patients with severe coronavirus disease-2019 (COVID-19). Remdesivir is an investigational drug studied in clinical trials for COVID-19 and is available to children and pregnant women through compassionate-use access but is not yet FDA approved. In early May, the US Department of Health and Human Services began to distribute remdesivir, donated by Gilead Sciences, Inc., to hospitals and state health departments for emergency use; multiple shipments have since been distributed. This process has raised questions of how remdesivir should be allocated. The Minnesota Department of Health has collaborated with the Minnesota COVID Ethics Collaborative and multiple clinical experts to issue an Ethical Framework for May 2020 Allocation of Remdesivir in the COVID-19 Pandemic. The framework builds on extensive ethical guidance developed for public health emergencies in Minnesota before the COVID-19 crisis. The Minnesota remdesivir allocation framework specifies an ethical approach to distributing the drug to facilities across the state and then among COVID-19 patients within each facility. This article describes the process of developing the framework and adjustments in the framework over time with emergence of new data, analyzes key issues addressed, and suggests next steps. Sharing this framework and the development process can encourage transparency and may be useful to other states formulating and refining their approach to remdesivir EUA allocation.

- Allocate among facilities in proportion to the total number of COVID-positive patients currently admitted per facility (or health care system) who are not already on remdesivir (eg, through compassionate use or clinical trials).
- Allocate based on 10-day course per patient.
- Patients allocated remdesivir who are later transferred may take the remainder of their course with them.
- All courses should be allocated without holding supply in reserve.
- Facilities with surplus drug after 72 hours should contact MDH for reallocation.

Text Box 2. How Should Remdesivir be Allocated Across the State Among Health Care Facilities?

- Clinical criteria for allocation are based on patient need (risk of serious morbidity or mortality without the medication) and likelihood of benefit defined as recovery to hospital discharge.
- Highest priority: patients on advanced respiratory support (high-flow nasal cannula, continuous positive airway pressure [CPAP] therapy, bilevel positive airway pressure [BiPAP] therapy) or patients with 3 out of 4 characteristics: $< 94\%$ oxygen saturation on room air; respiratory rate > 30; lung infiltrates on imaging; using supplemental oxygen.
- Second priority: patients who have been mechanically ventilated for ≤ 5 days or on ECMO for ≤ 5 days.
- When patients are otherwise of equal priority within a group and there is not sufficient drug for all patients in this group, a random process should be used to allocate.
- Patients who are imminently dying or terminally ill with life expectancy < 6 months should not be prioritized for access.
- Children and pregnant women are not included because of availability of remdesivir through the FDA's compassionate-use program.

Text Box 3. How Should Remdesivir be Allocated Within a Facility Among Patients?

- Use a triage officer or team (not bedside team) for randomization: facilities that have not yet deployed triage personnel may establish *ad hoc* triage processes.
- Remdesivir allocation should be documented at 2 levels: patients who receive EUA remdesivir under this framework should have that documented in their electronic health record (EHR), and facilities should maintain a log of allocation decisions (including randomization) to ensure transparency, accountability, and retrospective review.

Text Box 4. Processes for Allocation Within a Facility

MEDICAL SUBSPECIALTIES

ENDOCRINOLOGY

THE DIGITAL/VIRTUAL DIABETES CLINIC - THE FUTURE IS NOW. RECOMMENDATIONS FROM AN INTERNATIONAL PANEL ON DIABETES DIGITAL TECHNOLOGIES INTRODUCTION

Phillip M, Bergenstal RM, Close KL, Danne T, Garg SK, Heinemann L, Hirsch IB, Kovatchev BP, Laffel LM, Mohan V, Parkin CG, Battelino T.. Diabetes Technol Ther. 2020 Sep 9. doi: 10.1089/dia.2020.0375. Online ahead of print.
Level of Evidence: Other - Expert Opinion

BLUF

An expert opinion by endocrinologists from various institutions around the world discusses the need to utilize technology such as telehealth protocols and phone applications (apps) to monitor diabetes development. They outline current limitations: lack of uptake by patients and providers, considerable heterogeneity across apps, app use independent of healthcare provider input, lack of interoperability, and the burden of self-monitoring blood glucose levels. This article suggests that digital care will provide a new option for patients managing their care and will fill a gap for patients without access to timely care, as during the COVID-19 pandemic.

ABSTRACT

The increasing prevalence of diabetes, combined with a growing global shortage of healthcare professionals (HCP) necessitates the need to develop new approaches to diabetes care delivery in order to expand access to care, lessen the burden on people with diabetes, improve efficiencies and reduce the unsustainable financial liability on health systems and payers. Use of digital diabetes technologies and telehealth protocols within a digital/virtual diabetes clinic (D/VDC) has the potential to address these challenges. However, several issues must be resolved to move forward. In February 2020, organizers of the Advanced Technologies & Treatments for Diabetes (ATTD) Annual Conference convened an international panel of healthcare professionals, researchers, patient advocates, and industry representatives to review the status of digital diabetes technologies, characterize deficits in current technologies, and identify issues for consideration. Since that meeting, the importance of using telehealth and digital diabetes technologies has been demonstrated amid the global COVID-19 pandemic. This article summarizes the panel's discussion of the opportunities, obstacles and requisites for advancing use of these technologies as a standard of care for the management of diabetes.

SURGICAL SUBSPECIALTIES

ENHANCED RECOVERY AFTER SURGERY FOR KNEE ARTHROPLASTY IN THE ERA OF COVID-19

Ding BTK, Ng J, Tan KG.. J Knee Surg. 2020 Aug 24. doi: 10.1055/s-0040-1715125. Online ahead of print.
Level of Evidence: 3 - Non-randomized controlled cohort/follow-up study

BLUF

Retrospective review from the Journal of Knee Surgery evaluated the enhanced recovery after surgery (ERAS) protocol which sought to reduce length of hospital stay and complications for post op patients. When comparing cases of knee arthroplasties from the last quarter of 2019 (199 cases) to that of the first quarter in 2020 (76 cases), patients during the COVID-19 outbreak had shorter lengths of inpatient stay without significant changes to the complication or readmission rates. This suggests that the ERAS protocols may be even more beneficial during times such as the current pandemic.

ABSTRACT

Enhanced recovery after surgery (ERAS) represents a paradigm shift in perioperative care, aimed at achieving early recovery for surgical patients, reducing length of hospital stay, and complications. The purpose of this study was to provide an insight of the impact of the COVID-19 on ERAS protocols for knee arthroplasty patients in a tertiary hospital and potential strategy changes for postpandemic practice. We retrospectively reviewed all cases that underwent surgery utilizing ERAS protocols in the quarter prior to the pandemic (fourth quarter of 2019) and during the first quarter of 2020 when the pandemic started. A review of the literature on ERAS protocols for knee arthroplasty during the COVID-19 pandemic was also performed and discussed. A total of 199 knee arthroplasties were performed in fourth quarter of 2019 as compared with 76 in the first quarter of 2020 during the COVID-19 outbreak. Patients who underwent surgery in the first quarter of 2020 had shorter inpatient stays (3.8 vs. 4.5 days), larger percentage of discharges by postoperative day 5 (86.8 vs. 74.9%), and a larger proportion of patients discharged to their own homes (68 vs. 54%). The overall complication rate (1.3 vs. 3%) and readmission within 30 days (2.6 vs. 2%) was similar between both groups. ERAS protocols appear to reduce hospital lengths of stay for patients undergoing knee arthroplasty without increasing the risk of short-term complications and readmissions. The beneficial effects of ERAS appear to be amplified by and are synchronous with the requirements of operating in the era of a pandemic.

THE RELATIONSHIP BETWEEN RISK EVENT INVOLVEMENT AND RISK PERCEPTION DURING THE COVID-19 OUTBREAK IN CHINA

Qian D, Li O.. Appl Psychol Health Well Being. 2020 Aug 23. doi: 10.1111/aphw.12219. Online ahead of print.
Level of Evidence: 3 - Local non-random sample

BLUF

A survey study of Chinese participants (n=351) conducted from February 4 to February 7, 2020 by researchers with backgrounds in economics and management from Zhejiang University in China found a positive correlation between COVID-19 pandemic risk involvement ("being involved/exposed in a risk event at the moment") and both event-related and general health risk perception, which was mediated by fear or anxiety of risk. These findings suggest risk involvement may be an important consideration when developing population based health policies and guidelines intended to mitigate COVID-19 risk perception and its adverse effects.

ABSTRACT

BACKGROUND: The coronavirus disease 2019 (COVID-19) is a worldwide pandemic that continues to spread and the situation continues to deteriorate globally. It is also a risk event for the public in affected areas. However, little is known about the relationship between "being involved/exposed in a risk event at the moment" and people's risk perception of that event. METHODS: The mediation model and analysis of covariance method were performed on a Chinese sample (N = 351) during the outbreak of COVID-19 to test the underlying mechanism between risk event involvement and risk perception. RESULTS: Risk event involvement was positively related not only to people's event-related risk perception but also their general risk perception (i.e. risk perception towards other events), and negative emotion mediated these relationships. In addition, the residents of Wuhan (vs. non-Wuhan) exhibited significantly higher event-related risk perception as well as general risk perception. CONCLUSIONS: The findings deepen our understanding of risk perception by suggesting that being involved in a risk event at the moment is also a nonnegligible variable positively related to risk perception through increased negative emotion. Finally, theoretical and managerial implications of the result are discussed.

FIGURES

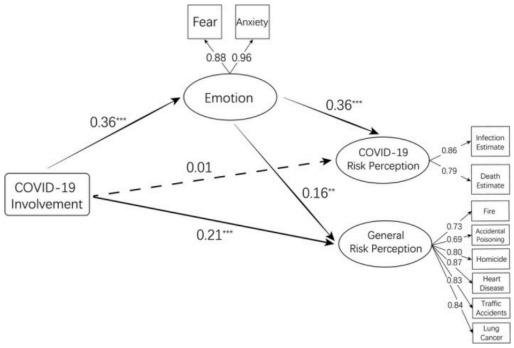

Figure 1. Standardised path coefficients for the mediation model predicting risk perception of COVID-19 and risk perception in general. The dashed line represents the insignificant path.

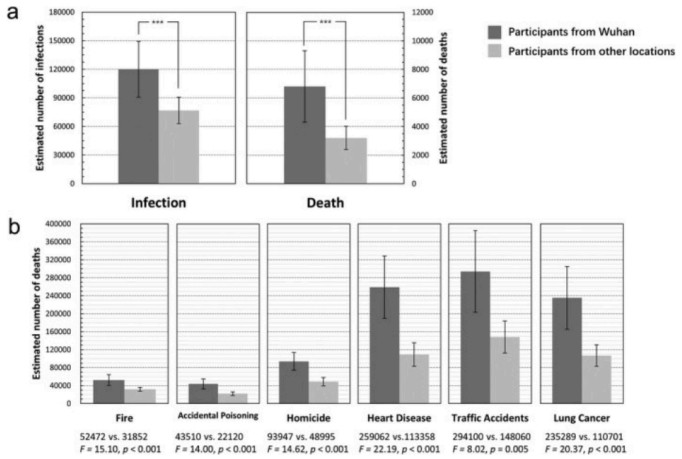

Figure 2. Comparison of (a) the estimated number of COVID-19 infections and deaths, and (b) the estimated number of deaths of six common causes in China between residents of Wuhan and non-Wuhan. Logarithmic transformation data were used in the data analysis. Raw data were used to construct this figure for better visual presentation.

Pathways	Estimate	SE	(%)	Lower	Upper
Risk perception of COVID-19				95% CI	
Involvement – risk perception (direct path)	0.01	0.07	7.14	−0.15	0.14
Involvement – emotion – risk Perception	0.13	0.03	92.86	0.08	0.20
Risk perception in general				95% CI	
Involvement – risk perception (direct path)	0.21	0.05	77.78	0.10	0.31
Involvement – emotion – risk perception	0.06	0.02	22.22	0.02	0.11

Table 2. Mediation Analysis for Covid-19 Involvement and Risk Perception

ACKNOWLEDGEMENTS

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