

The Daily COVID-19 Literature Surveillance Team Report

July 18, 2020



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COVID-19 Daily Literature Surveillance

COVID19LST



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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

Understanding the pathology:

- Highlights from [a literature review conducted by a Japanese cardiologist](#):
 - SARS-CoV-2 uses angiotensin-converting enzyme 2 (ACE2) receptors for cellular invasion.
 - Renin-Angiotensin-Aldosterone System (RAAS) inhibitor drugs are not associated with a higher risk of mortality from COVID-19.
 - An increased number of ACE receptors found in male and diabetic subjects may contribute to an increased susceptibility to the SARS-CoV-2 virus.In conclusion, the author urges more research on ACE2 and SARS-CoV-2 infectivity and whether medications for cardiovascular disease may affect disease severity and mortality.

Transmission and Prevention:

- This [survey conducted at 26 Detroit skilled nursing facilities](#) (SNF) found that after two repeated point prevalence surveys (testing all healthcare workers regardless of symptoms), separated by a median time interval of 15 days (IQR=14-17 days), the percentage of positive test results for SARS-CoV-2 decreased from 35% (n=373/1063 residents, 26 SNF) to 18% (n=115/637 residents, 12 SNF). The findings suggest that repeated point prevalence surveys may reduce SARS-CoV-2 transmission rates by initiating infection prevention and control activities and the authors recommend frequent surveys of healthcare workers as testing availability increases.
- This review article written by a multidisciplinary group of researchers aims to summarize [the current state of COVID-19 vaccine development](#). The authors grouped vaccine attempts into five general groups: DNA/RNA-based, viral vectors, protein subunit, inactivated virus, and live attenuated virus; experimental vaccines of all of these subtypes are currently in preclinical development, Phase I trials, or Phase II trials. The authors also bring up concerns about vaccine development, including the lack of cost-effective animal models of COVID-19 for vaccine testing and worries about viral mutations that could prevent vaccines from enabling long-lasting immunity, which altogether represent significant potential pitfalls standing in the way of societal use of a novel vaccine.

Management:

- A case series of 5 COVID-19-positive patients admitted to University Hospital of Trieste in Northeastern Italy during March and April 2020 found [neurological manifestations](#) (namely polyradiculoneuritis and cranial polyneuritis), clinical neurophysiology indications (conduction block, absence of F waves, etc.), and albuminocytological dissociation (in 3/5 patients) suggestive of Guillain Barré syndrome (GBS). Intravenous immunoglobulin (IVIG) therapy at 0.4 g/kg for 5 days partially resolved neurological symptoms in 4/5 patients. These observations suggest that clinicians should be aware of neurologic signs similar to GBS in COVID-19 patients and may consider the use of clinical neurophysiology and IVIG therapy in the management of these patients.

Adjusting the practice during COVID-19

- A narrative review conducted by the Department of Emergency Medicine at Singapore General Hospital discusses how [Singapore's largest hospital turned a multi-story car park \(MSCP\) into a flu screening area \(FSA\)](#) during the COVID-19 pandemic. The authors label this FSA as a physical component of Singapore General Hospital's surge capability, highlighting its use as a means to confront the recent COVID-19 outbreak. This operation is yet another example of efforts to repurpose facilities to accommodate growing COVID-19 infection rates.
- In this article, researchers from China and the United States argue that, [given the potential risks faced by pregnant patients during the pandemic, widespread use of online antenatal care should be encouraged](#). In an online survey of 983 pregnant patients in China, the authors observed increased fear of accessing general healthcare and antenatal care. They propose that online programs can alleviate this fear while maintaining many vital aspects of antenatal care, including blood pressure observation, fetal heart tone assessment, urine dipstick tests, blood glucose monitoring, patient education, and mental health evaluations. However, they also acknowledge the significant challenges in implementing these programs, including those related to ensuring quality of care, the lack of internet access in certain regions, and the reality that some antenatal conditions will always require in-person evaluation and management.
- Physicians from Italy performed a [retrospective study on pregnant persons with pre-gestational diabetes](#) (9 with type 1 diabetes mellitus [DM], 5 with type 2 DM) and found that 2 out of 14 patients tested positive for COVID-19. Both patients had type 1 DM and greater mean daily glycemic values compared to the patients who tested negative (134±4 vs 108±2 mg/dl, P=0.03). While this study has a small sample size, the authors suggest that the observed low prevalence of COVID-19 may reflect the impact that lockdown measures, continuous glucose monitoring at home, and use of telehealth services may have in reducing COVID-19 transmission.

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PREGNANT PERSONS

PRE-GESTATIONAL DIABETES DURING THE COVID-19 PANDEMIC IN BERGAMO, ITALY

Dodesini AR, Galliani S, Ciriello E, Bellante R, Trevisan R.. Int J Gynaecol Obstet. 2020 Jul 13. doi: 10.1002/ijgo.13306. Online ahead of print.

Level of Evidence: 3 - Local non-random sample

BLUF

Physicians affiliated with ASST Papa Giovanni XXIII hospital in Italy performed a retrospective study on pregnant persons with pre-gestational diabetes (9 with type 1 diabetes mellitus [DM], 5 with type 2 DM) from 22 February to 17 May 2020 and found that 2 out of 14 patients tested positive for COVID-19. Both patients had type 1 DM and greater mean daily glycemic values compared to the patients who tested negative (134 ± 4 vs 108 ± 2 mg/dl, $P=0.03$). While this study has a small sample size, the authors suggest that the observed low prevalence of COVID-19 may reflect the impact that lockdown measures, continuous glucose monitoring at home, and use of telehealth services may have in reducing COVID-19 transmission.

ABSTRACT

The COVID-19 pandemic has caused the proliferation of a highly contagious and frequently fatal pneumonia around the world.[1] COVID-19 has severely affected Italy, and at the onset of this crisis, Bergamo, a city in northern Italy, regularly reported the highest number of cases in the country for many weeks. During outbreaks of infectious disease, pregnant women represent a high-risk population due to their increased susceptibility to infections, particularly when comorbidities such as pre-gestational diabetes (present in 0.5% of pregnant populations) are present.[2,3] Few data are available on pregnant women with pre-gestational diabetes during the COVID-19 pandemic.

UNDERSTANDING THE PATHOLOGY

ANGIOTENSIN-CONVERTING ENZYME 2 AS A VERSATILE PLAYER IN THE MANAGEMENT OF CORONAVIRUS DISEASE 2019

Amano T.. J Diabetes Investig. 2020 Jul 13. doi: 10.1111/jdi.13346. Online ahead of print.

Level of Evidence: Other - Review / Literature Review

BLUF

Highlights from a literature review conducted by a Japanese cardiologist:

- 1) SARS-CoV-2 uses angiotensin-converting enzyme 2 (ACE2) receptors for cellular invasion.
- 2) Renin-Angiotensin-Aldosterone System (RAAS) inhibitor drugs are not associated with a higher risk of mortality from COVID-19.
- 3) An increased number of ACE receptors found in male and diabetic subjects may contribute to an increased susceptibility to the SARS-CoV-2 virus.

In conclusion, the author urges more research on ACE2 and SARS-CoV-2 infectivity and whether medications for cardiovascular disease may affect disease severity and mortality.

ABSTRACT

In view of the global coronavirus disease 2019 (COVID-19) pandemic, there are ongoing efforts aimed at predicting potential factors causing clinical exacerbation of COVID-19 and at seeking effective therapies for COVID-19. Recent studies have indicated that severe acute respiratory coronavirus 2 (SARS-CoV-2) uses angiotensin-converting enzyme 2 (ACE2) as a receptor for cellular invasion and subsequent replication.

IN VITRO

DOES THE HUMAN PLACENTA EXPRESS THE CANONICAL CELL ENTRY MEDIATORS FOR SARS-COV-2?

Pique-Regi R, Romero R, Tarca AL, Luca F, Xu Y, Alazizi A, Leng Y, Hsu CD, Gomez-Lopez N.. Elife. 2020 Jul 14;9:e58716. doi: 10.7554/eLife.58716. Online ahead of print.

Level of Evidence: Other - Mechanism-based reasoning

BLUF

This study from Wayne State University examined whether angiotensin-converting enzyme 2 (ACE-2) and transmembrane protease serine 2 (TMPRSS2), two proteins thought to be vital for SARS-CoV-2 cell entry, are expressed in placental tissue during each trimester. Using single-cell and single-nucleus RNA sequencing, they found that there is extremely limited co-expression of ACE-2 and TMPRSS2 in placental tissue (less than 1/10,000 cells), even with an extremely sensitive threshold of one transcript per cell (Figure 1, Figure 2). Alternate pathways for SARS-CoV-2 have been reported in in vitro studies, including transmembrane protein basigin (BSG), so they also investigated its expression and found BSG in placental tissue throughout all trimesters (Figure 2). Given the wide expression of BSG across cell-types, the researchers suggest that it may not be sufficient for SARS-CoV-2 cell entry and argue that this data provides a rationale for the observation that SARS-CoV-2 does not readily spread through vertical transmission.

ABSTRACT

The pandemic of coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has affected more than 10 million people, including pregnant women. To date, no consistent evidence for the vertical transmission of SARS-CoV-2 exists. The novel coronavirus canonically utilizes the angiotensin-converting enzyme 2 (ACE2) receptor and the serine protease TMPRSS2 for cell entry. Herein, building upon our previous single-cell study (Pique-Regi, 2019), another study, and new single-cell/nuclei RNA-sequencing data, we investigated the expression of ACE2 and TMPRSS2 throughout pregnancy in the placenta as well as in third-trimester chorioamniotic membranes. We report that co-transcription of ACE2 and TMPRSS2 is negligible in the placenta, thus not a likely path of vertical transmission for SARS-CoV-2. By contrast, receptors for Zika virus and cytomegalovirus, which cause congenital infections, are highly expressed by placental cell types. These data show that the placenta minimally expresses the canonical cell-entry mediators for SARS-CoV-2.

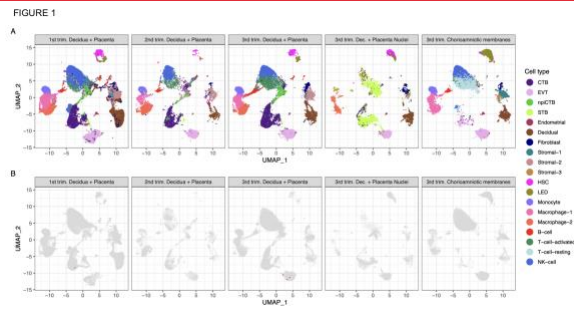


Figure 1. Transcriptional map of the human placenta, including the decidua, in the three trimesters of pregnancy. A. Uniform Manifold Approximation Plot (UMAP), where dots represent single cells/nuclei and are colored by cell type (abbreviations used are: STB, Syncytiotrophoblast; EVT, Extravillous trophoblast; CTB, cytotrophoblast; HSC, hematopoietic stem cell; npICTB, non proliferative interstitial cytotrophoblast; LED, lymphoid endothelial decidual cell) B. UMAP plot with cells/nuclei co-expressing one or more transcripts for ACE-2 and TMPRSS2, genes that are necessary for SARS-CoV-2 viral infection and spreading, in red.



Figure 2. Dot plot depicting the expression of different viral receptors/molecules used by SARS-CoV-2, ZIKV, and CMV. Each row represents a different cell type, and columns are grouped first by virus type, receptor/molecule gene, and placental tissue/time-of sampling (1DP, 2DP and 3DP represent the first, second, and third trimester, 3Nuc represents the third trimester nuclei, and 3CAM represents the third trimester chorioamnion membranes). The size of the dot represents the proportion of cells that express the receptor with more than zero transcripts, and the color represents the average gene expression for the subset of cells expressing that gene in transcripts per million (TPM). Cell type abbreviations used are: STB, Syncytiotrophoblast; EVT, Extravillous trophoblast; CTB, cytotrophoblast; HSC, hematopoietic stem cell; npICTB, non-proliferative interstitial cytotrophoblast; LED, lymphoid endothelial decidual cell.

TRANSMISSION & PREVENTION

DEVELOPMENTS IN TRANSMISSION & PREVENTION

INITIAL AND REPEATED POINT PREVALENCE SURVEYS TO INFORM SARS-COV-2 INFECTION PREVENTION IN 26 SKILLED NURSING FACILITIES - DETROIT, MICHIGAN, MARCH-MAY 2020

Sanchez GV, Biedron C, Fink LR, Hatfield KM, Polistico JMF, Meyer MP, Noe RS, Copen CE, Lyons AK, Gonzalez G, Kiama K, Lebednick M, Czander BK, Agbonze A, Surma AR, Sandhu A, Mika VH, Prentiss T, Zervos J, Dalal DA, Vasquez AM, Reddy SC, Jernigan J, Kilgore PE, Zervos MJ, Chopra T, Bezold CP, Rehman NK. MMWR Morb Mortal Wkly Rep. 2020 Jul 10;69(27):882-886. doi: 10.15585/mmwr.mm6927e1.

Level of Evidence: 3 - Non-randomized controlled cohort/follow-up study

BLUF

This survey study conducted at 26 Detroit skilled nursing facilities (SNF) from March-May 2020 found that after two repeated point prevalence surveys (testing all healthcare workers regardless of symptoms), separated by a median time interval of 15 days (IQR=14-17 days), the percentage of positive test results for SARS-CoV-2 decreased from 35% (n=373/1063 residents, 26 SNF) to 18% (n=115/637 residents, 12 SNF). The findings suggest that repeated point prevalence surveys may reduce SARS-CoV-2 transmission rates by initiating infection prevention and control activities and the authors recommend frequent surveys of healthcare workers as testing availability increases.

ABSTRACT

Skilled nursing facilities (SNFs) are focal points of the coronavirus disease 2019 (COVID-19) pandemic, and asymptomatic infections with SARS-CoV-2, the virus that causes COVID-19, among SNF residents and health care personnel have been described (1-3). Repeated point prevalence surveys (serial testing of all residents and health care personnel at a health care facility irrespective of symptoms) have been used to identify asymptomatic infections and have reduced SARS-CoV-2 transmission during SNF outbreaks (1,3). During March 2020, the Detroit Health Department and area hospitals detected a sharp increase in COVID-19 diagnoses, hospitalizations, and associated deaths among SNF residents. The Detroit Health Department collaborated with local government, academic, and health care system partners and a CDC field team to rapidly expand SARS-CoV-2 testing and implement infection prevention and control (IPC) activities in all Detroit-area SNFs. During March 7-May 8, among 2,773 residents of 26 Detroit SNFs, 1,207 laboratory-confirmed cases of COVID-19 were identified during three periods: before (March 7-April 7) and after two point prevalence surveys (April 8-25 and April 30-May 8): the overall attack rate was 44%. Within 21 days of receiving their first positive test results, 446 (37%) of 1,207 COVID-19 patients were hospitalized, and 287 (24%) died. Among facilities participating in both surveys (n = 12), the percentage of positive test results declined from 35% to 18%. Repeated point prevalence surveys in SNFs identified asymptomatic COVID-19 cases, informed cohorting and IPC practices aimed at reducing transmission, and guided prioritization of health department resources for facilities experiencing high levels of SARS-CoV-2 transmission. With the increased availability of SARS-CoV-2 testing, repeated point prevalence surveys and enhanced and expanded IPC support should be standard tools for interrupting and preventing COVID-19 outbreaks in SNFs.

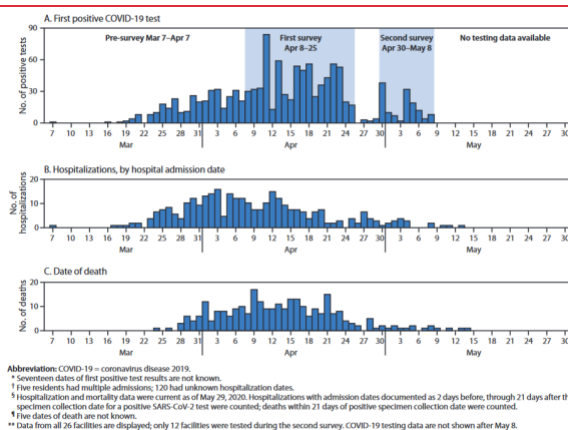


Figure 1. Skilled nursing facility residents with confirmed COVID-19 diagnosed by May 8, 2020, (A) by date of first positive SARS-CoV-2 test result (n = 1,190)*; (B) date of hospital admission (n = 331)†,§; and (C) date of death (n = 282)§,¶ — 26 facilities,** Detroit, March 7–May 29, 2020

CURRENT STATUS OF COVID-19 (PRE)CLINICAL VACCINE DEVELOPMENT

de Geest B, Ye T, Zhong Z, García-Sastre A, Schotsaert M.. Angew Chem Int Ed Engl. 2020 Jul 14. doi: 10.1002/anie.202008319. Online ahead of print.

Level of Evidence: Other - Review / Literature Review

BLUF

This review article written by a multidisciplinary group of researchers aims to summarize the current state of COVID-19 vaccine development. The authors grouped vaccine attempts into five general groups: DNA/RNA-based, viral vectors, protein subunit, inactivated virus, and live attenuated virus (Figure 1); experimental vaccines of all of these subtypes are currently in preclinical development, Phase I trials, or Phase II trials. The authors also bring up concerns about vaccine development, including the lack of cost-effective animal models of COVID-19 for vaccine testing and worries about viral mutations that could prevent vaccines from enabling long-lasting immunity, which altogether represent significant potential pitfalls standing in the way of societal use of a novel vaccine.

SUMMARY

Key information about the five general categories of vaccines:

1. Nucleic acid-based: This approach uses host cellular machinery to generate antigens and a subsequent immune response to the virus. These have good biocompatibility and potentially rapid, inexpensive, and scalable manufacturing.
2. Viral vectors: This technique relies on delivering antigens encoded in a modified virus to stimulate an immune response. These prompt strong immune responses and allow for targeted delivery.
3. Protein subunit based: These typically must involve a capsid or envelop protein in order to enable immunity. There is reduced immunogenicity with protein subunit based vaccines compared to other approaches, often necessitating booster doses.
4. Live attenuated: These involve less virulent versions of a virus and can induce a strong immune response but carry the risk of causing disease.
5. Killed inactivated: These cannot replicate to cause disease and are thus safer than the live attenuated strains. However, killed inactivated vaccines may have reduced efficacy compared to the live attenuated vaccines.

ABSTRACT

The current COVID-19 pandemic has a tremendous impact on daily life world-wide. Despite the ability to dampen the spread of SARS-CoV-2, the causative agent of the diseases, through restrictive interventions, it is believed that only effective vaccines will provide sufficient control over the disease and revert societal live back to normal. At present, a double-digit number of efforts are devoted to the development of a vaccine against COVID-19. Here, we provide an overview of these (pre)clinical efforts and provide background information on the technologies behind these vaccines. In addition, we discuss potential hurdles that need to be addressed prior to mass scale clinical translation of successful vaccine candidates.

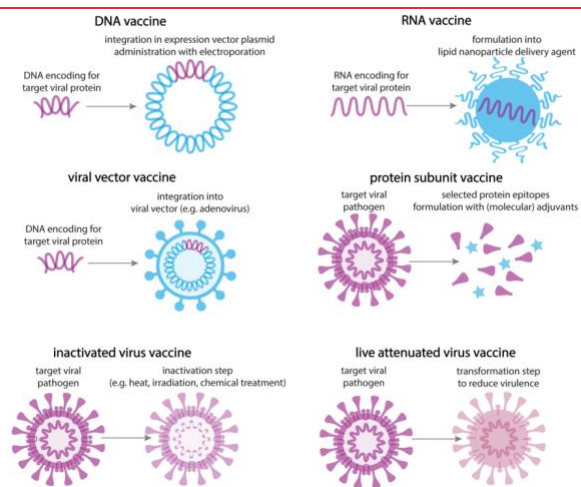


Figure 1. Schematic overview of the different types of vaccines.

NEUROLOGY

CLINICAL NEUROPHYSIOLOGY AND CEREBROSPINAL LIQUOR ANALYSIS TO DETECT GUILLAIN BARRÉ SYNDROME AND POLYNEURITIS CRANIALIS IN COVID-19 PATIENTS: A CASE SERIES

Manganotti P, Bellavita G, D'Acunto L, Tommasini V, Fabris M, Sartori A, Bonzi L, Buoite Stella A, Pesavento V.. J Med Virol. 2020 Jul 14. doi: 10.1002/jmv.26289. Online ahead of print.

Level of Evidence: 4 - Case-series

BLUF

A case series of 5 COVID-19-positive patients admitted to University Hospital of Trieste in Northeastern Italy during March and April 2020 found neurological manifestations (namely polyradiculoneuritis and cranial polyneuritis), clinical neurophysiology indications (conduction block, absence of F waves, etc.), and albuminocytological dissociation (in 3/5 patients) suggestive of Guillain Barré syndrome (GBS). Intravenous immunoglobulin (IVIG) therapy at 0.4 g/kg for 5 days partially resolved neurological symptoms in 4/5 patients. These observations suggest that clinicians should be aware of neurologic signs similar to GBS in COVID-19 patients and may consider the use of clinical neurophysiology and IVIG therapy in the management of these patients.

ABSTRACT

We report a case series of 5 patients affected by SARS-CoV-2 who developed neurological symptoms, mainly expressing as polyradiculoneuritis and cranial polyneuritis in the two months of COVID-19 pandemic in a city in the north east of Italy. A diagnosis of Guillain Barre syndrome was made on the basis of clinical presentation, cerebrospinal fluid analysis and electroneurography (ENG). In four of them therapeutic approach included the administration of intravenous immunoglobulin (0.4 gr/kg for 5 days), which resulted in the improvement of neurological symptoms. Clinical neurophysiology revealed the presence of conduction block, absence of F waves, and in two cases significant decrease in amplitude of compound motor action potential cMAP. Four patients presented a mild facial nerve involvement limited to the muscles of the lower face, with sparing of the forehead muscles associated to ageusia. In one patient, taste assessment showed right-sided ageusia of the tongue, ipsilateral to the mild facial palsy. In three patients we observed albuminocytological dissociation in the cerebrospinal fluid, and notably we found an increase of inflammatory mediators such as the interleukin-8. Peripheral nervous system involvement after infection with COVID-19 is possible and may include several signs that may be successfully treated with immunoglobulin therapy. This article is protected by copyright. All rights reserved.

ADJUSTING PRACTICE DURING COVID-19

REVIEW OF INDOOR AEROSOL GENERATION, TRANSPORT AND CONTROL IN THE CONTEXT OF COVID-19

Kohanski MA, Lo LJ, Waring MS.. Int Forum Allergy Rhinol. 2020 Jul 11. doi: 10.1002/alr.22661. Online ahead of print.
Level of Evidence: Other - Guidelines and Recommendations

BLUF

A review by authors in Pennsylvania, United States discussing SARS-CoV-2 transmission found that while long-range airborne transport is controversial, otorhinolaryngologic procedures and other aerosol generating procedures (those that generate infectious particles at high concentrations or create uncontrolled respiratory secretions; Table 1) increase the risk of viral transmission. They recommend awareness of clinical space airflow patterns, efficient air filtration/ventilation, and use of face shields and respirators to improve clinical safety and inform decisions based on societal and institutional guidelines to remain operational.

ABSTRACT

The coronavirus disease 2019 (COVID-19) pandemic has heightened awareness of aerosol generation by human expiratory events and their potential role in viral respiratory disease transmission. Concerns over high Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) viral burden of mucosal surfaces has raised questions about the aerosol generating potential and dangers of many otorhinolaryngologic procedures. However, the risks of aerosol generation and associated viral transmission by droplet or airborne routes for many otorhinolaryngology procedures are largely unknown. Indoor aerosol and droplet viral respiratory transmission risk is influenced by four factors: 1) aerosol or droplet properties, 2) indoor airflow, 3) virus-specific factors, and 4) host-specific factors. Here we elaborate on known aerosol versus droplet properties, indoor airflow, and aerosol generating events to provide context for risks of aerosol infectious transmission. We also provide simple but typically effective measures for mitigating the spread and inhalation of viral aerosols in indoor settings. Understanding principles of infectious transmission, aerosol and droplet generation, as well as concepts of indoor airflow, will aide in the integration of new data on SARS-CoV-2 transmission and activities that can generate aerosol to best inform on the need for escalation or de-escalation from current societal and institutional guidelines for protection during aerosol generating procedures. This article is protected by copyright. All rights reserved.

FIGURES

Table 1: CDC list of aerosol generating procedures. List of AGPs is based on a meta-analysis by Tran et al. of healthcare worker infection from the 2003 SARS outbreak, assessing data from retrospective case series involving procedures generally thought to be aerosol generating. Intubation was noted as the highest risk procedure (48).

| CDC list of Aerosol Generating Procedures |
|---|
| bronchoscopy |
| cardiopulmonary resuscitation |
| extubation |
| high flow oxygen |
| intubation |
| manual ventilation |
| nebulizer delivery |
| non-invasive ventilation |
| open suctioning of airways |
| sputum induction |

ACUTE CARE

DISEASE OUTBREAK SURGE RESPONSE: HOW A SINGAPORE TERTIARY HOSPITAL CONVERTED A MULTI-STOREY CARPARK INTO A FLU SCREENING AREA TO RESPOND TO THE COVID-19 PANDEMIC

Thangayah JR, Tan KBK, Lim CS, Fua TP.. Disaster Med Public Health Prep. 2020 Jul 14:1-19. doi: 10.1017/dmp.2020.249. Online ahead of print.

Level of Evidence: Other - Review / Literature Review

BLUF

A narrative review conducted by the Department of Emergency Medicine at Singapore General Hospital discusses how Singapore's largest hospital turned a multi-story car park (MSCP) into a flu screening area (FSA) during the COVID-19 pandemic. The authors label this FSA as a physical component of Singapore General Hospital's surge capability, highlighting its use as a means to confront the recent COVID-19 outbreak. This operation is yet another example of efforts to repurpose facilities to accommodate growing COVID-19 infection rates.

ABSTRACT

COVID-19, first documented in December 2019, was declared a public health emergency by the World Health Organisation (WHO) on 30th January 2020. The disease, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus, has affected more than 9 million people and contributed to at least 490,000 deaths globally as of June 2020, with numbers on the rise. Increased numbers of patients seeking medical attention during disease outbreaks can overwhelm healthcare facilities, hence requiring an equivalent response from healthcare services. Surge capacity is a concept that has not only been defined as the "ability to respond to a sudden increase in patient care demands" but also to "effectively and rapidly expand capacity". This narrative review discusses how Singapore's largest tertiary hospital has encapsulated the elements of surge capability and transformed a peacetime multi-storey carpark into a flu screening area in response to the COVID-19 disease outbreak.

SURGICAL SUBSPECIALTIES

ORGAN DONATION DURING THE COVID-19 PANDEMIC

Ahmed O, Brockmeier D, Lee K, Chapman WC, Doyle MB.. Am J Transplant. 2020 Jul 13. doi: 10.1111/ajt.16199. Online ahead of print.

Level of Evidence: 3 - Local non-random sample

BLUF

A survey study of 17 organ procurement organizations (OPOs) across the United States (Figure 1) conducted by researchers in St. Louis, Missouri compared March-May of 2019 to that of 2020 (two 90 day periods) and found that organ authorization decreased by 11% ($p=0.0001$), organ recovery for transplant decreased by 17% (Figure 4; $p=0.0001$), and organ transplantation decreased by 18% (Table 2; $p=0.0001$). Authors suggest that declines in organ donations may be attributed to change in authorization dynamics and OPO practice adjustments, however further quantitative research is needed to predict the effects of patient morbidity as a result of these changes.

ABSTRACT

The Covid-19 pandemic is a rapidly changing circumstance with dramatic policy changes and universal efforts to deal with the initial crisis and minimize its consequences. To identify changes to organ donation and transplantation during this time, an anonymous web-based survey was distributed to 19 select organ procurement organizations (OPOs) throughout the US comparing 90-day activity during March - May 2020 and March - May 2019. 17 OPOs responded to the survey (response rate of 89.5%). Organ authorization decreased by 11% during the current pandemic ($n=1379$ vs $n=1552$, $p=0.0001$). Organ recovery for transplantation fell by 17% ($p=0.0001$) with a further 18% decrease in the number of organs transplanted ($p=0.0001$). Donor cause of death demonstrated a 4.5% decline in trauma but a 35% increase in substance abuse cases during the Covid-19 period. All OPOs reported significant modifications in response to the pandemic, limiting the onsite presence of staff and transitioning to telephonic approaches for donor family correspondence. Organ donation during the current climate

has seen significant changes and the long-term implications of such shifts remain unclear. These trends during the Covid-19 era warrant further investigation to address unmet needs, plan for a proportionate response to the virus and mitigate the collateral impact.

FIGURES

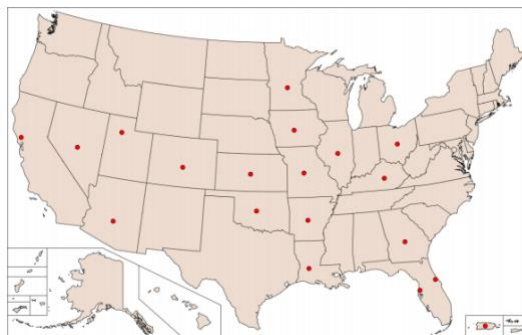


Figure 1. Locations of OPOs in the survey.

1. Arkansas Regional Recovery Agency (AR)
2. Nevada Donor Network (NV)
3. Our Legacy (FL)
4. Kentucky Organ Donor Affiliates (KY)
5. Midwest Transplant Network (KS)
6. Donor Network West (CA)
7. Lifefeshare of Oklahoma (OK)
8. Louisiana Organ Procurement Agency (LA)
9. Donor Network of Arizona (AZ)
10. Mid-America Transplant (MO)
11. Donor Alliance (CO)
12. LifeSource (MN)
13. LifeBanc (OH)
14. Gift of Hope (IL)
15. LifeLink of Florida (FL)
16. LifeLink of Georgia (GA)
17. LifeLink of Puerto Rico
18. Iowa Donor Network (IA)
19. Donor Connect (UT)

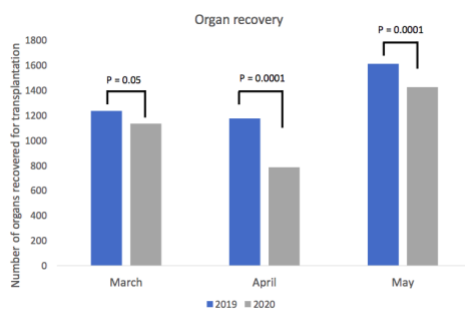


Figure 4. Monthly trends in organ recovery during March to May 2019 and March to May 2020.

| | Percentage decline | March – May 2020 | March – May 2019 | P Value |
|---------------------------------|--------------------|------------------|------------------|---------|
| All organ transplantation (n) | 18% | 2580 | 3148 | 0.0001 |
| Solid organ transplantation (n) | | | | |
| Heart | 24% | 247 | 324 | 0.0001 |
| Lung | 27% | 310 | 424 | |
| Liver | 19% | 603 | 748 | |
| Kidney | 15% | 1299 | 1522 | |
| Donor type (n) | | | | |
| DBD | 17% | 629 | 758 | 0.0001 |
| DCD | 12% | 202 | 230 | |
| ECD | 30% | 122 | 174 | |

Figure 4. Monthly trends in organ recovery during March to May 2019 and March to May 2020.

OBGYN

ONLINE ANTENATAL CARE DURING THE COVID-19 PANDEMIC: OPPORTUNITIES AND CHALLENGES

Wu H, Sun W, Huang X, Yu S, Wang H, Bi X, Sheng J, Chen S, Akinwunmi B, Zhang CJP, Ming WK.. J Med Internet Res. 2020 Jul 13. doi: 10.2196/19916. Online ahead of print.

Level of Evidence: Other - Expert Opinion

BLUF

In this article, researchers from China and the United States argue that, given the potential risks faced by pregnant patients during the pandemic, widespread use of online antenatal care should be encouraged. In an online survey of 983 pregnant patients in China, the authors observed increased fear of accessing general healthcare and antenatal care (Figure 1). They propose that online programs can alleviate this fear while maintaining many vital aspects of antenatal care, including blood pressure observation, fetal heart tone assessment, urine dipstick tests, blood glucose monitoring, patient education, and mental health evaluations. However, they also acknowledge the significant challenges in implementing these programs, including those related to ensuring quality of care, the lack of internet access in certain regions, and the reality that some antenatal conditions will always require in-person evaluation and management.

ABSTRACT

UNSTRUCTURED: During this ongoing global Coronavirus Disease (COVID-19) pandemic, people in different regions of the world have been greatly affected. Recently delivered mothers and currently pregnant women face a dilemma during this period, since they need professional antenatal care while there are high infection risks of severe respiratory syndrome coronavirus (SARS-CoV-2) in hospitals. Therefore, online antenatal care would be a preferable choice for these women because it could provide pregnancy-related information and online clinic consultations. In addition, online antenatal care could help to provide relatively cheaper medical services and diminish health inequality due to its convenience and cost-effectiveness, especially in developing countries or regions. However, some pregnant women will doubt the reliability of such online information. Therefore, it is important to determine how to ensure the quality of online services and establish a stable mutual trust between pregnant women and online programs. Here we report how the COVID-19 pandemic brings not only opportunities for the development and popularization of online antenatal care programs but also challenges.

FIGURES

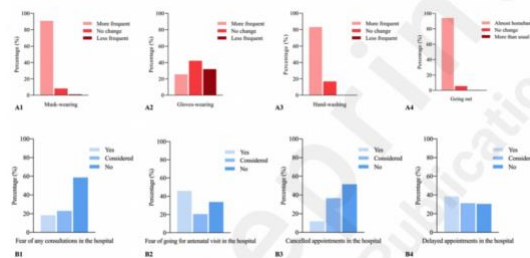


Figure 1. Pregnant patient's self-protection behaviors and attitudes towards antenatal care in hospitals.

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