Emerging Evidence Search Request

Please note: Our "Emerging Evidence" feature is based on the existing literature at the time the question is asked to provide the most informed answers possible to questions about COVID-19, and the science continues to evolve. As with any research, studies need to be replicated and there needs to be a strong body of evidence before any absolute conclusions can be made.

Questions about UHN policy or practice are best directed to the appropriate department (e.g. IPAC, Occupational Health).

Question:

"Is there a link between COVID 19 and coagulation and strokes?"

Additional Results from an Updated Search July 2, 2020

1.

Impact of COVID-19 outbreak on ischemic stroke admissions and in-hospital mortality in North-West Spain.
Meza HT; Lambea Gil A; Saldana AS; Martinez-Zabaleta M; Juez PR; Martinez EL; Apilanez MC; Isasi MH; Enguita JM; Alfonso ML; Arenillas JF; Olaizola JS; Fernandez JJT; Sanchez J; Castellanos-Rodrigo M; Roel A; Menendez IC; Freijo M; Rodriguez AL; Portilla EP; Lopez YJ; Castro ER; Rivas SA; Garcia JT; Rodriguez IB; Julian-Villaverde F; Garcia MPM; Trejo-Gabriel-Galan JM; Iniguez AE; Juste CT; Lazaro CP; Moreno JM; On Behalf Of The Nordictus Investigators.
International Journal of Stroke. 1747493020938301, 2020 Jun 26.
[Journal Article]
UI: 32525468
BACKGROUND AND PURPOSE: Spain has been one of the countries heavily stricken by COVID-19. But this epidemic has not affected all regions equally. We analyzed the impact of the COVID-19 pandemic on hospital stroke admissions and in-hospital mortality in tertiary referral hospitals from North-West Spain.
METHODS: Spanish multicenter retrospective observational study based on data from tertiary hospitals of the NORDICTUS network. We recorded the number of patients admitted for ischemic stroke between 30 December 2019 and 3 May 2020, the number of IVT and EVT procedures, and in-hospital mortality.
RESULTS: In the study period, 2737 patients were admitted with ischemic stroke. There was a decrease in the weekly mean admitted patients during the pandemic (124 vs. 173, p<0.001). In-hospital mortality of stroke patients increased significantly (9.9% vs. 6.5%, p = 0.003), but there were no differences in the proportion of IVT (17.3% vs. 16.1%, p = 0.405) or EVT (22% vs. 23%, p = 0.504).
CONCLUSION: We found a decrease in the number of ischemic stroke admissions and an increase in in-hospital mortality during the COVID-19 epidemic in this large study from North-West Spain. There were regional changes within the network, not fully explained by the severity of the pandemic in different regions.
Version ID
1

Status
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Year of Publication
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Link to UHN Full Text:
Serial Solutions

2.

Coronavirus disease 2019 and stroke in Iran: a case series and effects on stroke admissions.
Mehrpour M; Shuaib A; Farahani M; Hatamabadi HR; Fatehi Z; Ghaffari M; Moghadam NB; Aghamiri SH; Mansouri B; Assarzadegan F; Lima BS; Hesami O.
International Journal of Stroke. 1747493020937397, 2020 Jun 26.
[Journal Article]
UI: 32510283
OBJECTIVE: The coronavirus disease 2019 pandemic has affected healthcare systems around the globe and massively impacted patients with various non-infectious, life-threatening conditions. Stroke is a major neurological disease contributing to death and disability worldwide, and is still an ongoing issue during the pandemic. Here we investigate the impact of the coronavirus disease 2019 outbreak on stroke manifestations, treatment courses, the outcome of stroke patients, and the hospitalization rate in a referral center for stroke management in Tehran, Iran.
METHODS: We extracted data regarding 31 stroke patients (10 patients with laboratory-confirmed coronavirus disease 2019) and compared the demographic and pathological characteristics of the patients with or without coronavirus disease 2019 infection. The association of demographic/pathological characteristics of stroke patients during the coronavirus disease 2019 pandemic and a corresponding period during the previous year (49 patients) and an earlier period during the same year as the pandemic (50 patients) was also evaluated.
RESULTS: The absolute number of admissions decreased about 40% during the coronavirus disease 2019 pandemic. Except for the stroke severity (P = 0.002), there were no significant changes in the demographic and pathological characteristics of the stroke patients during the three studied periods. A

significantly higher mean of age (75.60 +/- 9.54 versus 60.86 +/- 18.45; P = 0.007), a significant difference in the type of stroke (P = 0.046), and significantly higher stroke severity (P = 0.024) were observed in stroke patients with coronavirus disease 2019 compared with those of stroke patients without coronavirus disease 2019. Treatment approaches, duration of hospitalization, and mortality rates did not differ significantly.
CONCLUSIONS: This report shows that the pandemic caused the number of acute stroke admissions to plummet compared to other periods. Although the pandemic did not affect the treatment plans and care of the patients, stroke cases with coronavirus disease 2019 had higher age, more large vessel ischemic stroke, and more severe stroke. Further studies are urgently needed to realize the probable interaction of the coronavirus disease 2019 pandemic and the neurologic disease.
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Year of Publication
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Link to UHN Full Text:
Serial Solutions

3.

Coagulopathy in COVID-19. [Review]
Iba T; Levy JH; Levi M; Thachil J.
Journal of Thrombosis & Haemostasis. 2020 Jun 18.
[Journal Article. Review]
UI: 32558075
The COVID-19 pandemic has become an urgent issue in every country. Based on recent reports, the most severely ill patients present with coagulopathy, and disseminated intravascular coagulation (DIC)-like massive intravascular clot formation is frequently seen in this cohort. Therefore, coagulation tests may be considered useful to discriminate severe cases of COVID-19. The clinical presentation of COVID-

19-associated coagulopathy is organ dysfunction primarily, while hemorrhagic events are less frequent. Changes in hemostatic biomarkers represented by increase in D-dimer and fibrin/fibrinogen degradation products indicate the essence of coagulopathy is massive fibrin formation. In comparison with bacterial-sepsis-associated coagulopathy/DIC, prolongation of prothrombin time, and activated partial thromboplastin time, and decrease in antithrombin activity is less frequent and thrombocytopenia is relatively uncommon in COVID-19. The mechanisms of the coagulopathy are not fully elucidated, however. It is speculated that the dysregulated immune responses orchestrated by inflammatory cytokines, lymphocyte cell-death, hypoxia, and endothelial damage are involved. Bleeding tendency is uncommon, but the incidence of thrombosis in COVID-19 and the adequacy of current recommendations regarding standard venous thromboembolic dosing are uncertain.

Version ID
1
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Year of Publication
2020

Link to UHN Full Text:
Serial Solutions

4.

Manifestations of blood coagulation and its relation to clinical outcomes in severe COVID-19 patients: Retrospective analysis.
Zhang Y; He L; Chen H; Lu S; Xiong Y; Liu J; Zheng Y; Wang S; Liu L.
International Journal of Laboratory Hematology. 2020 Jun 27.
[Journal Article]
UI: 32592539
INTRODUCTION: Characteristics of blood coagulation and its relation to clinical outcomes in COVID-19 patients are still rarely reported. We aimed to investigate the blood coagulation function and its influences on clinical outcomes of patients with syndrome coronavirus 2 (SARS-CoV-2) infection.
METHODS: A total of 71 severe patients with confirmed SARS-CoV-2 infection who were treated in Wuhan First Hospital from February 12 to March 20, 2020, were enrolled. The blood coagulation data in these patients and in 61 healthy controls were collected. The patients with COVID-19 were divided into two groups: the aggravated group and the nonaggravated group, respectively, basing on whether the patients' conditions turned to critically ill or not after admission.
RESULTS: Compared with healthy controls, patients with COVID-19 had significant performances with coagulation dysfunction, including dramatically elevated values of FIB, PT, APTT, INR, FDP, and D-Dimers but markedly reduced AT value ($P < .05$). Importantly, more noteworthy coagulation disorders similar to the differences between patients and controls were found in the aggravated patients with

conditions deterioration after admission than those in the nonaggravated patients without conditions deterioration (P < .05). Moreover, the aggravated patients possessed a longer hospital stay and a higher mortality compared with the nonaggravated patients (P < .001). The coagulation parameters of COVID-19 patients were widely and closely related to the indexes of liver function and inflammation (P < .05), indicating the coagulation dysfunction of these patients may be caused by liver injury and inflammatory storm.
CONCLUSION: Severe patients with SARS-CoV-2 infection often possess coagulation dysfunction on admission. A certain correlation exists in coagulation disorder and adverse clinical outcome among severe COVID-19 patients.

Version ID
1
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Link to UHN Full Text:
Serial Solutions

5.

Entangling COVID-19 associated thrombosis into a secondary antiphospholipid antibody syndrome: Diagnostic and therapeutic perspectives (Review).
Cavalli E; Bramanti A; Ciurleo R; Tchorbanov AI; Giordano A; Fagone P; Belizna C; Bramanti P; Shoenfeld Y; Nicoletti F.
International Journal of Molecular Medicine. 2020 Jun 25.
[Journal Article]
UI: 32588061
The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a novel beta coronavirus that is the etiological agent of the pandemic coronavirus disease 2019 (COVID-19) that at the time of writing (June 16, 2020) has infected almost 6 million people with some 450,000 deaths. These numbers are still rising daily. Most (some 80%) cases of COVID-19 infection are asymptomatic, a substantial number of cases (15%) require hospitalization and an additional fraction of patients (5%) need recovery in intensive care units. Mortality for COVID-19 infection appears to occur globally between 0.1 and 0.5% of infected patients although the frequency of lethality is significantly augmented in the elderly and in patients with

other comorbidities. The development of acute respiratory distress syndrome and episodes of thromboembolism that may lead to disseminated intravascular coagulation (DIC) represent the primary causes of lethality during COVID-19 infection. Increasing evidence suggests that thrombotic diathesis is due to multiple derangements of the coagulation system including marked elevation of D-dimer that correlate negatively with survival. We propose here that the thromboembolic events and eventually the development of DIC provoked by SARS-CoV-2 infection may represent a secondary anti-phospholipid antibody syndrome (APS). We will apply both Baconian inductivism and Cartesian deductivism to prove that secondary APS is likely responsible for coagulopathy during the course of COVID-19 infection. Diagnostic and therapeutic implications of this are also discussed.
Version ID
1
Status
Publisher
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Cavalli, Eugenio; Bramanti, Alessia; Ciurleo, Rosella; Tchorbanov, Andrey I; Giordano, Antonio; Fagone, Paolo; Belizna, Cristina; Bramanti, Placido; Shoenfeld, Yehuda; Nicoletti, Ferdinando.
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Year of Publication
2020

Link to UHN Full Text:
Serial Solutions

6.

COVID-19 Is an Independent Risk Factor for Acute Ischemic Stroke.
Belani P; Schefflein J; Kihira S; Rigney B; Delman BN; Mahmoudi K; Mocco J; Majidi S; Yeckley J; Aggarwal A; Lefton D; Doshi AH.
Ajnr: American Journal of Neuroradiology. 2020 Jun 25.
[Journal Article]
UI: 32586968
BACKGROUND AND PURPOSE: Coronavirus disease 2019 (COVID-19) is an active worldwide pandemic with diverse complications. Stroke as a presentation has not been strongly associated with COVID-19. The authors aimed to retrospectively review a link between COVID-19 and acute stroke.
MATERIALS AND METHODS: We conducted a retrospective case-control study of 41 cases and 82 control subjects matched by age, sex, and risk factors. Cases were patients who underwent stroke alert

imaging with confirmed acute stroke on imaging between March 16 and April 5, 2020, at 6 hospitals across New York City. Control subjects were those who underwent stroke alertimaging during the same timeframe without imaging evidence of acute infarction. Data pertaining to diagnosis of COVID-19 infection, patient demographics, and risk factors were collected. A univariate analysis was performed to assess the covariate effect of risk factors and COVID-19 status on stroke imaging with positive findings. RESULTS: The mean age for cases and controls was 65.5 +/- 15.3 years and 68.8 +/- 13.2 years, respectively. Of patients with acute ischemic stroke, 46.3% had COVID-19 infection compared with 18.3% of controls (P = .001). After adjusting for age, sex, and risk factors, COVID-19 infection had a significant independent association with acute ischemic stroke compared with control subjects (OR, 3.9; 95% CI, 1.7-8.9; P = .001).
CONCLUSIONS: We demonstrated that COVID-19 infection is significantly associated with imaging confirmation of acute ischemic stroke, and patients with COVID-19 should undergo more aggressive monitoring for stroke.

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1
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Year of Publication
2020

Link to UHN Full Text:
Serial Solutions

7.

The Emerging Threat of (Micro)Thrombosis in COVID-19 and Its Therapeutic Implications.
McFadyen JD; Stevens H; Peter K.
Circulation Research. 2020 Jun 26.
[Journal Article]
UI: 32586214
The recent emergence of SARS-CoV-2 and the ensuing global pandemic has presented a health emergency of unprecedented magnitude. Recent clinical data has highlighted that COVID-19 is associated with a significant risk of thrombotic complications ranging from microvascular thrombosis, venous thromboembolic disease and stroke. Importantly, thrombotic complications are markers of severe COVID-19 and are associated with multi-organ failure and increased mortality. The evidence to date supports the concept that the thrombotic manifestations of severe COVID-19 is due to the ability of SARS-CoV-2 to invade endothelial cells via angiotensin-converting enzyme 2 (ACE2), which is expressed on the endothelial cell surface. However, in patients with COVID-19 the subsequent endothelial inflammation, complement activation, thrombin generation, platelet and leukocyte recruitment, and the initiation of innate and adaptive immune responses culminate in immunothrombosis, ultimately causing (micro)thrombotic complications such as deep vein thrombosis, pulmonary embolism and stroke. Accordingly, the activation of coagulation (e.g. as measured with plasma D-dimer) and thrombocytopenia have emerged as prognostic markers in COVID-19. Given thrombotic complications are central determinants of the high mortality rate in COVID-19, strategies to prevent thrombosis are of critical importance. A number of antithrombotic drugs have been proposed as potential therapies to prevent COVID-19-associated thrombosis, including, heparin, FXII inhibitors, fibrinolytic drugs, nafamostat and dipyridamole, many of which also possess pleiotropic anti-inflammatory or anti-viral effects. The growing awareness and mechanistic understanding of the prothrombotic state of COVID-19 patients is driving efforts to more stringent diagnostic screening for thrombotic complications and to the early institution of antithrombotic drugs, for both the prevention and therapy of thrombotic complications. The shifting paradigm of diagnostic and treatment strategies holds significant promise to reduce the burden of thrombotic complications and ultimately improve the prognosis for patients with COVID-19.
Version ID
1
Status
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Year of Publication
2020

Link to UHN Full Text:
Serial Solutions

8.

COVID-19-associated coagulopathy: An exploration of mechanisms.
Colling ME; Kanthi Y.
Vascular Medicine. 1358863X20932640, 2020 Jun 19.
[Journal Article]
UI: 32558620
An ongoing global pandemic of viral pneumonia (coronavirus disease [COVID-19]), due to the virus SARS-CoV-2, has infected millions of people and remains a threat to many more. Most critically ill patients have respiratory failure and there is an international effort to understand mechanisms and predictors of disease severity. Coagulopathy, characterized by elevations in D-dimer and fibrin(ogen) degradation products (FDPs), is associated with critical illness and mortality in patients with COVID-19. Furthermore, increasing reports of microvascular and macrovascular thrombi suggest that hemostatic imbalances may contribute to the pathophysiology of SARS-CoV-2 infection. We review the laboratory and clinical findings of patients with COVID-19-associated coagulopathy, and prior studies of hemostasis in other viral infections and acute respiratory distress syndrome. We hypothesize that an imbalance between coagulation and inflammation may result in a hypercoagulable state. Although thrombosis initiated by the innate immune system is hypothesized to limit SARS-CoV-2 dissemination, aberrant activation of this system can cause endothelial injury resulting in loss of thromboprotective mechanisms, excess thrombin generation, and dysregulation of fibrinolysis and thrombosis. The role various components including neutrophils, neutrophil extracellular traps, activated platelets, microparticles, clotting factors, inflammatory cytokines, and complement play in this process remains an area of active investigation and ongoing clinical trials target these different pathways in COVID-19.
Version ID
1
Status
Publisher
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Year of Publication
2020

Link to UHN Full Text:
Serial Solutions

9.

Cerebral ischemic and hemorrhagic complications of coronavirus disease 2019.

Sweid A; Hammoud B; Bekelis K; Missios S; Tjoumakaris SI; Gooch MR; Herial NA; Zarzour H; Romo V; DePrince M; Rosenwasser RH; Jabbour P.
International Journal of Stroke. 1747493020937189, 2020 Jun 26.
[Journal Article]
UI: 32501751
BACKGROUND: The coronavirus disease 2019 is associated with neurological manifestations including stroke.
OBJECTIVES: We present a case series of coronavirus disease 2019 patients from two institutions with acute cerebrovascular pathologies. In addition, we present a pooled analysis of published data on large vessel occlusion in the setting of coronavirus disease 2019 and a concise summary of the pathophysiology of acute cerebrovascular disease in the setting of coronavirus disease 2019.
METHODS: A retrospective study across two institutions was conducted between 20 March 2020 and 20 May 2020, for patients developing acute cerebrovascular disease and diagnosed with coronavirus disease 2019. We performed a literature review using the PubMed search engine.
RESULTS: The total sample size was 22 patients. The mean age was 59.5 years, and 12 patients were female. The cerebrovascular pathologies were 17 cases of acute ischemic stroke, 3 cases of aneurysm rupture, and 2 cases of sinus thrombosis. Of the stroke and sinus thrombosis patients, the mean National Institute of Health Stroke Scale was 13.8 +/- 8.0, and 16 (84.2%) patients underwent a mechanical thrombectomy procedure. A favorable thrombolysis in cerebral infarction score was achieved in all patients. Of the 16 patients that underwent a mechanical thrombectomy, the mortality incidence was five (31.3%). Of all patients (22), three (13.6%) patients developed hemorrhagic conversion requiring decompressive surgery. Eleven (50%) patients had a poor functional status (modified Rankin Score 3-6) at discharge, and the total mortality incidence was eight (36.4%).
CONCLUSIONS: Despite timely intervention and favorable reperfusion, the mortality rate in coronavirus disease 2019 patients with large vessel occlusion was high in our series and in the pooled analysis. Notable features were younger age group, involvement of both the arterial and venous vasculature, multivessel involvement, and complicated procedures due to the clot consistency and burden.
Version ID
1
Status
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Year of Publication
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Link to UHN Full Text:
Serial Solutions

10.

New onset neurologic events in people with COVID-19 infection in three regions in China.
Xiong W; Mu J; Guo J; Lu L; Liu D; Luo J; Li N; Liu J; Yang D; Gao H; Zhang Y; Lin M; Shen S; Zhang H; Chen L; Wang G; Luo F; Li W; Chen S; He L; Sander JW; Zhou D.
Neurology. 2020 Jun 17.
[Journal Article]
UI: 32554771
OBJECTIVE: To investigate new-onset neurologic impairments associated with coronavirus disease 2019 (COVID-19).
METHODS: A retrospective multicenter cohort study conducted between 18 January and 20 March 2020 including people with confirmed COVID-19 from 56 hospitals officially designated in three Chinese regions; data were extracted from medical records. New-onset neurologic events as assessed by neurology consultants based on manifestations, clinical examination and investigations, in which critical events included disorders of consciousness, stroke, CNS infection, seizures and status epilepticus.
RESULTS: We enrolled 917 people with average age 48.7 years and 55% were male. The frequency of new onset critical neurologic events was 3.5% (32/917) overall and 9.4% (30/319) among those with severe or critical COVID-19. These were impaired consciousness (n=25) or/and stroke (n=10). The risk of critical neurologic events was highly associated with age above 60 years and previous history of neurological conditions. Non-critical events were seen in less than 1% (7/917), including muscle cramp, unexplained headache, occipital neuralgia, tic and tremor. Brain CT in 28 people led to new findings in nine. Findings from lumbar puncture in three with suspected CNS infection, unexplained headache or severe occipital neuralgia were unremarkable.
CONCLUSIONS: People with COVID-19 aged over 60 and neurologic comorbidities were at higher risk of developing critical neurologic impairment, mainly impaired consciousness and cerebrovascular accidents. Brain CT should be considered when new-onset brain injury is suspected, especially in people under sedation or showing an unexplained decline in consciousness. Evidence of direct acute insult of SARS-COV-2 to the CNS is still lacking.

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1
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Year of Publication
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Link to UHN Full Text:
Serial Solutions

11.

The thromboembolism in COVID-19: the unsolved problem.

Casale M; Dattilo G; Imbalzano E; Gigliotti De Fazio M; Morabito C; Mezzetti M; Busacca P; Signorelli SS; Brunetti ND; Correale M.
Panminerva Medica. 2020 Jun 16.
[Journal Article]
UI: 32549531
INTRODUCTION: The recent Sars-Cov-2 pandemic (COVID-19) has led to growing research to explain the poor clinical prognosis in some patients.
EVIDENCE ACQUISITION: While early observational studies highlighted the role of the virus in lung failure, in a second moment thrombosis emerged as a possible explanation of the worse clinical course in some patients. Despite initial difficulties in management of such patients, the constant increase of literature in the field is to date clarifying some questions from clinicians. However, several other questions need answer.
EVIDENCE SYNTHESIS: A novel disease (Covid-19) due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection was responsible for thousands of hospitalizations for severe acute respiratory syndrome, with several cases of thrombotic complications due to excessive inflammation, platelet activation, endothelial dysfunction, and stasis. Covid-19 and hospitalizations for Covid-19 may carry several potential risk factors for thrombosis. Severe coagulation abnormalities may occur in almost all of the severe and critical ill COVID-19 cases.
CONCLUSIONS: Despite a strong pathophysiological rationale, the evidences in literature are not enough to recommend an aggressive antithrombotic therapy in COVID- 19. However, it is our opinion that an early use, even at home at the beginning of the disease, could improve the clinical course.
Version ID
1
Status
Publisher
Authors Full Name
Casale, Matteo; Dattilo, Giuseppe; Imbalzano, Egidio; Gigliotti De Fazio, Marianna; Morabito, Claudia; Mezzetti, Maurizio; Busacca, Paolo; Signorelli, Salvatore S; Brunetti, Natale D; Correale, Michele.
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Year of Publication
2020

Link to UHN Full Text:
Serial Solutions

12.

Coagulopathy in COVID-19 and Its Implication for Safe and Efficacious Thromboprophylaxis.
Langer F; Kluge S; Klamroth R; Oldenburg J.
Hamostaseologie. 2020 Jun 04.
[Journal Article]
UI: 32498097
The novel coronavirus, SARS-CoV-2, is causing a global pandemic of life-threatening multiorgan disease, called COVID-19. Accumulating evidence indicates that patients with COVID-19 are at significant risk of thromboembolic complications, mainly affecting the venous, but also the arterial vascular system. While the risk of venous thromboembolism (VTE) appears to be higher in patients requiring intensive care unit support compared to those admitted to general wards, recent autopsy findings and data on the timing of VTE diagnosis relative to hospitalization clearly suggest that thromboembolic events also contribute to morbidity and mortality in the ambulatory setting. In addition to a severe hypercoagulable state caused by systemic inflammation and viral endotheliitis, some patients with advanced COVID-19 may develop a coagulopathy, which meets established laboratory criteria for disseminated intravascular coagulation, but is not typically associated with relevant bleeding. Similar to other medical societies, the Society of Thrombosis and Haemostasis Research has issued empirical recommendations on initiation, dosing, and duration of pharmacological VTE prophylaxis in COVID-19 patients.

Version ID
1
Status
Publisher
Authors Full Name
Langer, Florian; Kluge, Stefan; Klamroth, Robert; Oldenburg, Johannes.
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Oldenburg, Johannes. Institut fur Experimentelle Hamatologie und Transfusionsmedizin, Universitatsklinik Bonn, Bonn, Germany.
Other Abstract
Publisher
Das neue Coronavirus SARS-CoV-2 ist fur eine weltweite Pandemie der lebensbedrohlichen Multiorganerkrankung COVID-19 verantwortlich. Zahlreiche Fallserien und Beobachtungsstudien zeigen, dass betroffene Patienten ein erhebliches Risiko fur Thromboembolien aufweisen, die vor allem das venose, jedoch auch das arterielle Gefassystem betreffen. Wahrend das Risiko fur eine venose Thromboembolie (VTE) bei Intensivpatienten hoher zu sein scheint als bei Patienten auf der Normalstation, deuten aktuelle Obduktionsbefunde und Analysen des zeitlichen Zusammenhangs zwischen VTE-Diagnose und Krankenhausaufnahme darauf hin, dass Thromboembolien auch im ambulanten Bereich signifikant zur Morbiditat und Mortalitat beitragen. Zusatzlich zur Hyperkoagulabilitat, hervorgerufen durch Entzundung und virale Endotheliitis, entwickeln einige Patienten mit fortgeschrittener Erkrankung eine Koagulopathie, die die Laborkriterien einer disseminierten intravasalen Gerinnung erfullt, jedoch selten mit einer Blutungsneigung einhergeht. Wie andere Fachgesellschaften hat auch die GTH e.V. empirische Empfehlungen zur Indikationsstellung, Dosierung und Dauer einer medikamentosen VTE-Prophylaxe bei COVID-19 formuliert.
Language: German
Year of Publication
2020

Link to UHN Full Text:
Serial Solutions

13.

Acute ischemic stroke and COVID-19.
Hassett C; Gedansky A; Mays M; Uchino K.
Cleveland Clinic Journal of Medicine. 2020 Jun 03.
[Journal Article]
UI: 32493736
Ischemic stroke may be a presenting feature of COVID-19. Its etiology remains unclear, but severe COVID-19 disease might increase the risk of large-artery strokes. More evidence is needed to substantiate the current reports and provide insights for optimal management.

Version ID
1
Status
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Year of Publication
2020

Link to UHN Full Text:
Serial Solutions

14.

COVID-19 and Stroke: Incidental, Triggered or Causative.
Bhatia R; Srivastava MVP.
Annals of Indian Academy of Neurology. 23(3):318-324, 2020 May-Jun.
[Journal Article]
UI: 32606519
Stroke is a serious neurological comorbidity observed during the ongoing COVID-19 (coronavirus associated disease 2019) pandemic caused by SARS-CoV-2 (severe acute respiratory syndrome, corona virus 2) and includes ischemic stroke, intracerebral haemorrhage and cerebral venous thrombosis. We reviewed factors that could potentially contribute to the occurrence of stroke among patients with COVID-19. There could be an interaction between the conventional risk factors of stroke, infection, systemic inflammatory response and plaque destabilisation. Inflammatory markers, D-dimer elevation and increased cytokine activity have been observed in patients with COVID-19. Other probable contributing factors include cardiac injury leading to embolism, a prothrombotic state and a possibility of direct

neuroinvasive potential causing vasculopathy. Data from stroke patients gathered in large multicentric cohorts could help shed more light on the occurrence, behaviour, aetiology, pathophysiology, biomarkers and outcomes of stroke occurring during the ongoing pandemic.

Version ID
1
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Year of Publication
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Link to UHN Full Text:
Serial Solutions

15.

Intracerebral Hemorrhage and SARS-CoV-2: Association or Causation.
Agarwal A; Vishnu VY; Vibha D; Bhatia R; Gupta A; Das A; Srivastava MVP.
Annals of Indian Academy of Neurology. 23(3):261-264, 2020 May-Jun.
[Journal Article]
UI: 32606509
Background: Recent respiratory infection including SARS-CoV-2 is an independent risk factor for acute cerebrovascular disease.
Purpose: There have been reports linking haemorrhagic strokes to SARS-CoV-2 infection during this pandemic, which lead us to evaluate if SARS-CoV-2 infection could be associated with increased risk of intracerebral haemorrhage (ICH).
Methods: A retrospective observational study evaluating all stroke cases admitted in our centre in the past one month.
Results: More than half (56%) had ICH, compared to 22% last year. Two patients with ICH were SARS-CoV-2 positive and they had no or mild respiratory symptoms and had higher occurrence of renal dysfunction.
Conclusion: There could be possible association between ICH and SARS-CoV-2 infections. However, a prospective study with larger sample size is needed to elucidate the pathogenesis.

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1
Status
PubMed-not-MEDLINE
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Year of Publication
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Link to UHN Full Text:
Serial Solutions

16.

Potential mechanisms of hemorrhagic stroke in elderly COVID-19 patients.
Wang H; Tang X; Fan H; Luo Y; Song Y; Xu Y; Chen Y.
Aging. 12(11):10022-10034, 2020 06 11.
[Journal Article. Research Support, Non-U.S. Gov't]
UI: 32527987
The novel severe acute respiratory syndrome coronavirus 2 is the causative agent of coronavirus disease 2019, a new human infectious disease. While fever, cough, and respiratory distress are typical first symptoms, a fraction of those affected present instead with neurological symptoms suggestive of central nervous system compromise. This review summarizes the potential contribution of coronavirus disease 2019 to hemorrhagic stroke in the elderly and proposes possible mechanisms. Reports show that the most affected patients have underlying chronic diseases such as hypertension and diabetes, which are two key risk factors for hemorrhagic stroke. Angiotensin-converting enzyme 2 is the main host cell surface receptor interacting with the severe acute respiratory syndrome coronavirus 2 spike glycoprotein to allow viral entry and infection. We speculate that ensuing downregulation of angiotensin-converting enzyme 2 expression may compound the risk conferred by pre-existing comorbidities and critically influence the pathogenesis of hemorrhagic stroke by elevating blood pressure and impairing cerebrovascular endothelial function. Additionally, both age- and/or disease-related immune dysfunction and enhanced catecholamine release secondary to anxiety and stress may also aggravate central nervous system symptoms of severe acute respiratory syndrome coronavirus 2 infection. Thus, assessment of systemic inflammatory biomarkers and tight control of hemodynamic parameters upon admission are crucial to minimize mortality and morbidity in coronavirus disease 2019 patients with central nervous system symptoms suggestive of incipient stroke.
Version ID
1
Status
In-Process
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Year of Publication
2020

Link to UHN Full Text:
Serial Solutions

17.

Interventional Stroke Care in the Era of COVID-19.
Salahuddin H; Castonguay AC; Zaidi SF; Burgess R; Jadhav AP; Jumaa MA.
Frontiers in neurology [electronic resource].. 11:468, 2020.
[Journal Article]
UI: 32574245
The current coronavirus disease (COVID-19) pandemic caused by severe acute respiratory syndrome coronavirus 2 has led to immense strain on healthcare systems and workers. Patients with severe symptoms of COVID-19 may also present with acute neurological emergencies such as ischemic stroke. Ischemic stroke in these patients may result from COVID-19 related complications or decompensation of previously asymptomatic cerebrovascular disorders, or concurrent ischemic stroke from common stroke risk factors in a patient with COVID-19. Acute ischemic stroke patients with large vessel occlusions require emergent triage, intensive care, and mechanical thrombectomy. Management of patients with large vessel occlusions (LVO) requires special considerations in the current pandemic. Physicians must now account for prognosis of severe COVID-19, resource utilization, and risk of infection to healthcare workers when determining eligibility for mechanical thrombectomy (MT). Here, we describe important prognostic factors including age, laboratory, and imaging findings to consider for MT selection and provide suggestions for taking care of patients with LVO and possible or confirmed COVID-19. It is recommended to perform MT in patients within the established guidelines, and consider a conservative approach in cases where there is clinical equipoise to minimize futile reperfusion. Lastly, we describe an illustrative case of a patient with ischemic stroke and COVID-19.

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1
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Year of Publication
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Link to UHN Full Text:
Serial Solutions

18.

Neurological manifestations and implications of COVID-19 pandemic. [Review]
Tsivgoulis G; Palaiodimou L; Katsanos AH; Caso V; Kohrmann M; Molina C; Cordonnier C; Fischer U; Kelly P; Sharma VK; Chan AC; Zand R; Sarraj A; Schellinger PD; Voumvourakis KI; Grigoriadis N; Alexandrov AV; Tsiodras S.
Therapeutic Advances in Neurological Disorders. 13:1756286420932036, 2020.
[Journal Article. Review]
UI: 32565914
The novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged in Wuhan, China and rapidly spread worldwide, with a vast majority of confirmed cases presenting with respiratory symptoms. Potential neurological manifestations and their pathophysiological mechanisms have not been thoroughly established. In this narrative review, we sought to present the neurological manifestations associated with coronavirus disease 2019 (COVID-19). Case reports, case series, editorials, reviews, case-control and cohort studies were evaluated, and relevant information was abstracted. Various reports of neurological manifestations of previous coronavirus epidemics provide a roadmap regarding potential neurological complications of COVID-19, due to many shared characteristics between these viruses and SARS-CoV-2. Studies from the current pandemic are accumulating and report COVID-19 patients presenting with dizziness, headache, myalgias, hypogeusia and hyposmia, but also with more serious manifestations including polyneuropathy, myositis, cerebrovascular diseases, encephalitis and encephalopathy. However, discrimination between causal relationship and incidental comorbidity is often difficult. Severe COVID-19 shares common risk factors with cerebrovascular diseases, and it is currently unclear whether the infection per se represents an independent stroke risk factor. Regardless of any direct or indirect neurological manifestations, the COVID-19 pandemic has a huge impact on the management of neurological patients, whether infected or not. In particular, the majority of stroke services worldwide have been negatively influenced in terms of care delivery and fear to access healthcare services. The effect on healthcare quality in the field of other neurological diseases is additionally evaluated.

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1
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Year of Publication
2020

Link to UHN Full Text:
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19.

Stroke as a complication and prognostic factor of COVID-19. [Review] Ictus como complicacion y como factor pronostico de COVID-19.
Trejo-Gabriel-Galan JM.
Neurologia. 35(5):318-322, 2020 Jun.
[Journal Article. Review]
UI: 32493597

INTRODUCTION: Contradictory data have been reported on the incidence of stroke in patients with COVID-19 and the risk of SARS-CoV-2 infection among patients with history of stroke.
METHODS: This study systematically reviews case series reporting stroke as a complication of COVID-19, and analyses the prognosis of patients with COVID-19 and history of stroke. The pathophysiological mechanisms of stroke in patients with COVID-19 are also reviewed.
CONCLUSIONS: History of stroke increases the risk of death due to COVID-19 by 3 times. Stroke currently seems not to be one of the main complications of COVID-19.

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1
Status
In-Process
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Year of Publication
2020

Link to UHN Full Text:
Serial Solutions

20.

Should the Management of Embolic Stroke in the Elderly Be Changed if They Also Have COVID-19?.
Seabra C; Silva B; Fagundes V; Rocha J; Nogueira L; Mesquita M.
European Journal of Case Reports in Internal Medicine. 7(6):001736, 2020.
[Journal Article]
UI: 32523932
Introduction: A strong association between stroke and atrial fibrillation (AF) has been demonstrated. Anticoagulation for the prevention of stroke in high-risk patients has the benefit of improving the life expectancy, quality of life, autonomy and social functioning of the patient. The COVID-19 pandemic poses challenges for stroke patients because of the association between SARS-CoV-2 infection and thromboembolic risk.
Case description: We describe the case of an 84-year-old female patient admitted due to an embolic stroke and non-anticoagulated AF. Her admission symptoms were sensory-motor aphasia and severe right limb paresis with an NIHSS score of 24. The diagnosis of embolic stroke (namely, total anterior circulation infarct; TACI) was made. Her stroke was extensive so she was not started on anticoagulation. During hospitalization, new embolic events occurred and a concomitant diagnosis of COVID-19 was made with progressive respiratory dysfunction followed by multiorgan failure. The patient died despite appropriate treatment.
Discussion: The prognosis of elderly patients with cardioembolic stroke depends on anticoagulation administration. The NIHSS score on admission of our patient meant anticoagulation therapy was not appropriate. The diagnosis of COVID-19 contributed to the patient's death.
LEARNING POINTS: Anticoagulation should be considered in stroke patients with total infarction and atrial fibrillation. There is an association between COVID-19 and thromboembolic stroke.Elderly patients with stroke and COVID-19 are at higher risk of death.

Version ID

1
Status
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Mesquita, Mari. Centro Hospitalar Tamega e Sousa, Penafiel, Portugal.
Year of Publication
2020

Link to UHN Full Text:
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21.

Risk of Ischemic Stroke in Patients with Covid-19 versus Patients with Influenza.
Merkler AE; Parikh NS; Mir S; Gupta A; Kamel H; Lin E; Lantos J; Schenck EJ; Goyal P; Bruce SS; Kahan J; Lansdale KN; LeMoss NM; Murthy SB; Stieg PE; Fink ME; Iadecola C; Segal AZ; Campion TR; Diaz I; Zhang C; Navi BB.
MedRxiv : the Preprint Server for Health Sciences. 2020 May 21.
[Preprint]
UI: 32511527
IMPORTANCE: Case series without control groups suggest that Covid-19 may cause ischemic stroke, but whether Covid-19 is associated with a higher risk of ischemic stroke than would be expected from a viral respiratory infection is uncertain.
OBJECTIVE: To compare the rate of ischemic stroke between patients with Covid-19 and patients with influenza, a respiratory viral illness previously linked to stroke.
DESIGN: A retrospective cohort study.
SETTING: Two academic hospitals in New York City.
PARTICIPANTS: We included adult patients with emergency department visits or hospitalizations with Covid-19 from March 4, 2020 through May 2, 2020. Our comparison cohort included adult patients with emergency department visits or hospitalizations with influenza A or B from January 1, 2016 through May 31, 2018 (calendar years spanning moderate and severe influenza seasons). Exposures: Covid-19 infection confirmed by evidence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the nasopharynx by polymerase chain reaction, and laboratory-confirmed influenza A or B. Main Outcomes and Measures: A panel of neurologists adjudicated the primary outcome of acute ischemic stroke and its clinical characteristics, etiological mechanisms, and outcomes. We used logistic regression to compare the proportion of Covid-19 patients with ischemic stroke versus the proportion among patients with influenza.
RESULTS: Among 2,132 patients with emergency department visits or hospitalizations with Covid-19, 31 patients (1.5%; 95% confidence interval [CI], 1.0%-2.1%) had an acute ischemic stroke. The median age of patients with stroke was 69 years (interquartile range, 66-78) and 58% were men. Stroke was the reason for hospital presentation in 8 (26%) cases. For our comparison cohort, we identified 1,516 patients with influenza, of whom 0.2% (95% CI, 0.0-0.6%) had an acute ischemic stroke. After adjustment for age, sex, and race, the likelihood of stroke was significantly higher with Covid-19 than with influenza infection (odds ratio, 7.5; 95% CI, 2.3-24.9).

CONCLUSIONS AND RELEVANCE: Approximately 1.5% of patients with emergency department visits or hospitalizations with Covid-19 experienced ischemic stroke, a rate 7.5-fold higher than in patients with influenza. Future studies should investigate the thrombotic mechanisms in Covid-19 in order to determine optimal strategies to prevent disabling complications like ischemic stroke.
Version ID
1
Status
PubMed-not-MEDLINE
Authors Full Name
Merkler, Alexander E; Parikh, Neal S; Mir, Saad; Gupta, Ajay; Kamel, Hooman; Lin, Eaton; Lantos, Joshua; Schenck, Edward J; Goyal, Parag; Bruce, Samuel S; Kahan, Joshua; Lansdale, Kelsey N; LeMoss, Natalie M; Murthy, Santosh B; Stieg, Philip E; Fink, Matthew E; Iadecola, Costantino; Segal, Alan Z; Campion, Thomas R; Diaz, Ivan; Zhang, Cenai; Navi, Babak B.
Year of Publication
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Ovid MEDLINE(R) ALL <1946 to July 01, 2020>

Search history sorted by search number ascending

#	Searches	Results	Type
1	exp Stroke/	133933	Advanced
2	stroke?.mp.	298010	Advanced
3	((cerebrovascular or vascular) adj2 accident?).mp.	8991	Advanced
4	exp Blood Coagulation/	58681	Advanced
5	(blood adj2 (coagulation* or clot*)).mp.	93801	Advanced
6	exp Thrombosis/	129077	Advanced
7	thrombos?s.mp.	195161	Advanced
8	1 or 2 or 3 or 4 or 5 or 6 or 7	608849	Advanced
9	limit 8 to covid-19	585	Advanced
10	limit 9 to dt="20200605-20200702"	221	Advanced

11	remove duplicates from 10	221	Advanced
12	limit 11 to "causation-etiology (best balance of sensitivity and specificity)"	83	Advanced
13	from 12 keep 3-4, 7, 15, 17-21, 31, 34...	21	Advanced

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