COVID-19 AND STROKE

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ABSTRACT

- Since the inception of Covid-19 on March 11, 2020, Covid-19 has affected several organs in the body including the lungs, heart, and the brain. Covid-19 produces multiple symptoms ranging from cough, fever and chills, pain or pressure on the chest, to even stroke. In-hospital mortality is higher in patients with stroke and COVID-19 compared to historical non-COVID-19 patients. The management of stroke following Covid-19 is very similar to that of stroke patients without Covid-19. Use of Recombinant Tissue Plasminogen Activator (rtPA) and Thrombectomy are some of the common therapies used to manage COVID-19 induced stroke.

INTRODUCTION

- Most strokes, specifically ischemic strokes, occur when there is an obstruction in the flow of blood to the brain. Age, gender, and race play a role in generation of a stroke. Controllable risk factors include high blood pressure, tobacco use, obesity, heart conditions, and more recently, Covid-19. The inflammation, cardiac conditions, general illness paired with organ failure, and clotting formed by Covid-19 increase the chances of getting a stroke. There appears to be a clear association between COVID-19 and stroke in young populations without typical vascular risk factors, at times with only mild respiratory symptoms, are increasing. We have researched the relationship between COVID-19 and stroke.

WHAT IS COVID-19

- Covid-19, is a fast spreading virus that has made a large impact on the world and everyday life. It spreads faster than the flu, and has caused almost 3 million deaths worldwide, and counting. It attacks the respiratory system, mainly affecting the lungs. The virus attacks the healthy cells in the lungs and begins to multiply, causing complications. By making it harder for the lungs to get oxygen to the bloodstream, the body begins to become weak, sometimes enough to cause death.

EFFECT OF COVID-19 ON THE BODY

Some effects of Covid-19 include:

- Fever or chills
- Cough
- Shortness of breath or difficulty in breathing
- Headache
- Diarrhea
- Persistent pain or pressure in the chest
- Stroke

COVID-19 AND STROKE

- Stroke is a frequent complication among COVID-19 patients.
- Since the COVID-19 outbreak, there has been an increase in the number of strokes among young and middle-aged people who have contracted COVID-19. There appears to be a clear association between COVID-19 and stroke in young populations without typical vascular risk factors, at times with only mild respiratory symptoms.
- In-hospital mortality is higher in patients with stroke and COVID-19 compared to historical non-COVID-19 patients.
- Young patients show a higher mortality due to a higher incidence of large vessel occlusion than older patients.
- COVID-19 virus can cause changes in the way the cells function.
- COVID-19 triggers a response from the immune system, which produces chemicals in our bodies that cause more changes to how we normally function.

SYMPTOMS OF STROKE

- Strokes are characterized by fatigue in the limbs of one side of the body, which can lead to difficulty in walking.
- Loss of coordination as a result of unexpected migraines and lightheadedness.
- Slurred speech and difficulty interpreting language.
- Women are more likely to feel more nauseous or disoriented with additional memory issues on top of the typical stroke symptoms, specifically during pregnancies.

COMPLICATIONS OF STROKE

- DVT as a direct result of immobility where clots form in a leg vein. There is a 7·6-fold increase in the odds of stroke with COVID-19 compared with influenza.
- In one study, 1916 patients with emergency department visits or hospitalizations with COVID-19 had an elevated risk of ischemic stroke compared with 1486 patients with emergency department visits or hospitalizations with influenza.
- Fatality: significantly more in acute ischemic strokes than without (Figure 1).

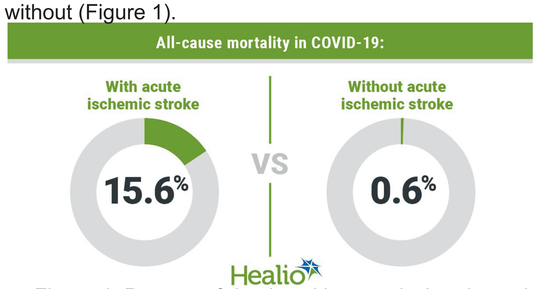

Figure 1: Percent of deaths with acute ischemic strokes vs without acute ischemic strokes

MECHANISM FOR THE CEREBROVASCULAR EVENTS FOLLOWING COVID-19

- A hypercoagulable state from systemic inflammation and cytokine storm.
- Postinfectious immune-mediated responses.
- Direct viral-induced endotheliitis or endotheliopathy, potentially leading to angiopathic thrombosis, with viral particles having been isolated from the endothelium of various tissues, including brain tissue.

SCARE OF COVID-19 AND HOSPITALIZATION AMONGST DIFFERENT RACES

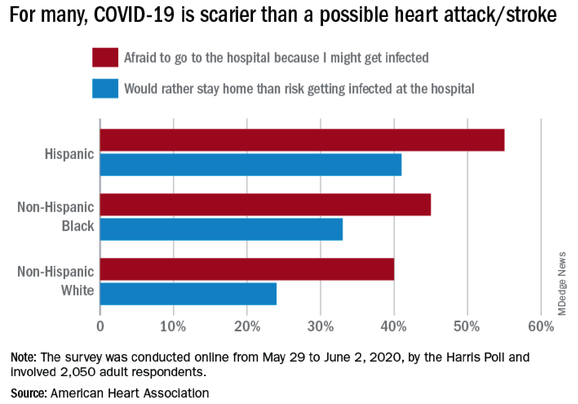

Figure 2: Scare of COVID-19 and stroke vs MI

DIAGNOSIS OF COVID-19 INDUCED STROKE

- PE
- CT Scan
- MRI
- Concentration of inflammation and hypercoagulability markers such as increase in white cell count, C reactive protein and D dimer.
- The routine diagnostic tests ought to be performed.

FUTURE DIRECTIONS

We plan to study the following unfinished research areas in the future:

1. Ways that COVID-19 might affect brain health.
2. Does the virus attack the brain directly?
3. Is a lack of oxygen a cause of stroke?

MANAGEMENT OF COVID-19 INDUCED STROKE

- Anticoagulation therapy early in the COVID-19 disease course before any thrombotic event is strongly recommended.
- I/V Recombinant Tissue Plasminogen Activator (rtPA)
- Thrombectomy.
- IVC filter

CONCLUSIONS

- COVID has been shown to damage nearly every organ in the body, including the lungs, heart, and brain. There is a 7·6-fold increase in the odds of stroke with COVID-19 in comparison to influenza. In-hospital mortality is higher in patients with stroke and COVID-19 compared to historical non-COVID-19 patients. The management of stroke following Covid-19 is very similar to that of stroke patients without Covid-19. Recombinant Tissue Plasminogen Activator (rtPA), IVC filter and Thrombectomy are used to manage these patients.

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