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A Retrospective Observational Study on Post Covid Inflammatory State as a Risk Factor for Cerebrovascular Lesions-Stroke

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I. INTRODUCTION

- SARS-COV-2 viral infection primarily targets the respiratory system with a clinical picture thatvaries from simple symptoms to respiratory distress syndrome requiring hospitalization in theintensive care unit.
- SARS-CoV-2 also has neuro-invasive capabilities and could spread from the respiratory system to the central nervous system due to excessive inflammation, immobilization, hypoxia and DIC.
- Recently, some patients with COVID-19 have been shown to have neurological symptoms such as headache, anosmia, dysgeusia, dizziness, impaired consciousness, and ischemic stroke.
- Theory suggests that SARS COV 2 facilitates the recruitment of inflammatory cells into blood vessels, which leads to the release of inflammatory markers and cytokines that subsequently activate coagulation.
- COVID-19 runs its course in two phases, the initial incubation phase and later clinical symptomatic phase.
- Patients in the initial incubation phase often have insidious clinical symptoms, but they are still highly contagious. At the later clinical symptomatic phase, the immune system is fully activated and the disease may enter the severe infection stage in this phase.
- Although many patients are known for their respiratory symptoms, they had neurological symptoms in their first 1–2 days of clinical symptomatic phase, and ischemic stroke occurred 2 weeks after the onset of the clinical symptomatic phase.
- Ischemic stroke has been widely described among the thrombo-embolic complications of COVID-19.
- The COVID-19 spike protein attaches to the ACE2 receptor on various organs and activates an inflammatory cascade. It also attaches to the ACE2 receptor on endothelium and activates a prothrombotic state.
- y binding to ACE2, the SARS-CoV-2 virus may damage vascular endothelial
- cells by inhibiting mitochondrial function and endothelial nitric oxide synthetase activity, leading to secondary cardiovascular and cerebrovascular effects.
- Mechanisms of stroke can vary from thromboembolism,large-artery atherosclerosis, COVID-19–associated myocarditis, to arrhythmias, cryptogenic.
- COVID-19 stroke patients were younger, tend to be men, and have an increased stroke severity, compared with stroke patients in the prepandemic period.

II. MATERIAL AND METHODS

- Design of study-Retrospective cohort
- Methods of collection-A total of 163 patients aged from 18-80 years who attended the emergency department of GGH,KKD with stroke from June 1st to August 15th, 2021 are included in this study.
- Inclusion criteria- Acute strokes of both ischemic and hemorrhagic ethology are included between ages 18-80 years. Patients who gave consent and who were affected by Recent Covid-19 within past 1 month irrespective of their vaccination status with/ without comorbidities like Diabetes, hypertension are included.
- Exclusion criteria-patients with recurrent CVA, affected by mucormycosis and patients who did not consent for study.
- The study is incepted by recruiting stroke patients later confirmation test for COVID-19 is dose by taking a swab in nasopharynx by polymerase chainreaction.
- The primary outcome was acute stroke and information on demographics, vascular risk factors, respiratory symptoms (cough & dyspnoea), steroid and oxygen usage and mortality were collected.
- Stroke was diagnosed by clinical examination for all the patients.
- All patients underwent Ct-Brain which showed ischemic type in 123 patients and

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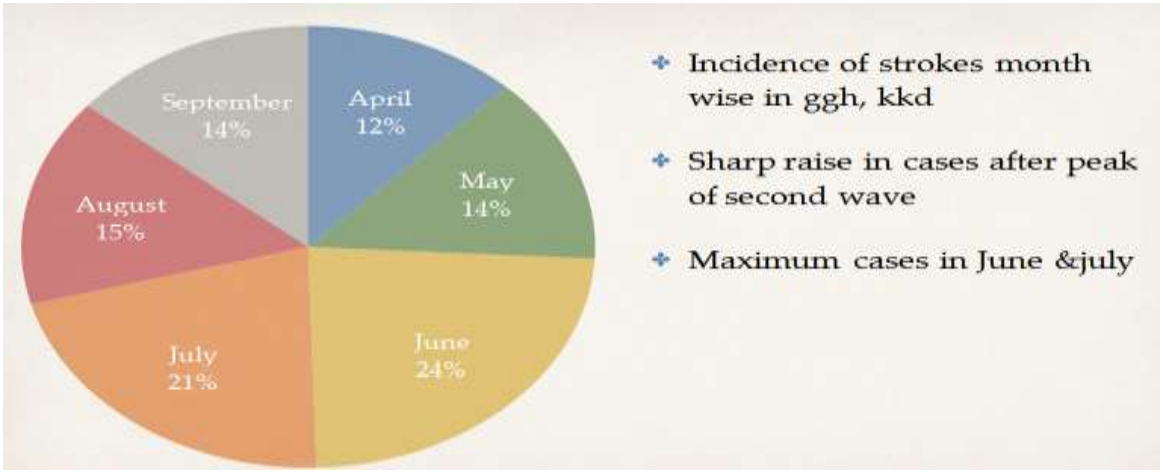
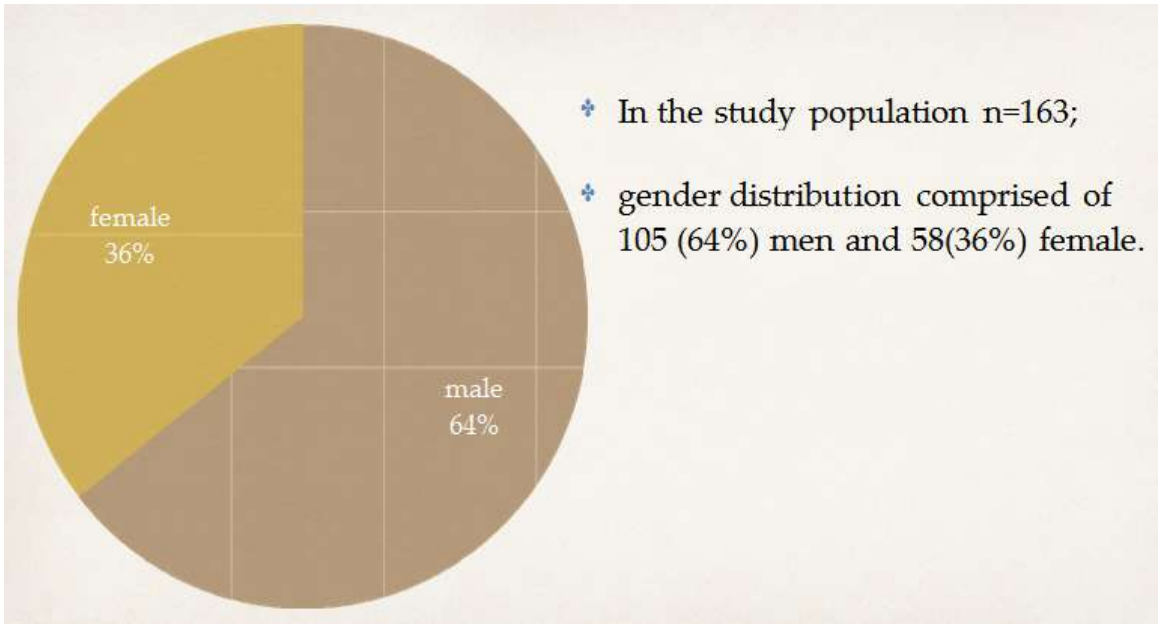
hemorrhagic in 40 patients.

- MR-angiogram was done for 86 patients which showed large vessel occlusion for 33 cases and rest 53 cases had branch occlusion.

III. ANALYSIS

- The data was entered in an excel sheet and a P value of <0.05 is taken significant.
- Mean age was 49.12±10yrs, which had 105 (64%) were men and 58(36%) werefemale.
- Among the strokes 63(38.6%) patients are not completely vaccinated.
- 8(4.9%) patients had presented with an acute stroke with a previous h/o covid or PCR-reactivity.
- 135(82.8%) patients had vascular risk factors like DM&HTN and 50(30.6%) patients had respiratory symptoms.
- 5(62.5%) out 8 patients who had acute stroke with previous Covid infection are <40yrs of age with no vascular risk factors like DM/HTN.
- 6(75%) of 8 patients having previous covid-19 used steroid/oxygen during treatment.
- 123(75.4%) patients had ischemic stroke when viewed in CT and 33(20%) patients out of 86 had large vessel occlusion when viewed in MR-ANGIO.
- 4(50%)Stroke Patients with Covid-19 infection had large vessel occlusion.
- 25(15.6%) of 163 patients had succumbed to death during their course of hospital stay out of which 4(50%) deaths were in patients with a recent Covid infection.





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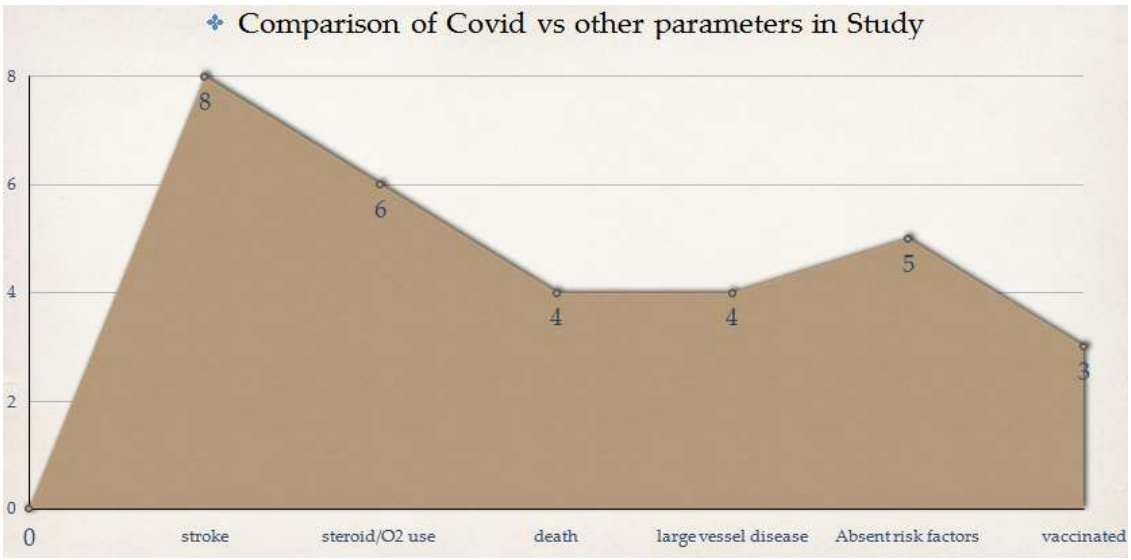

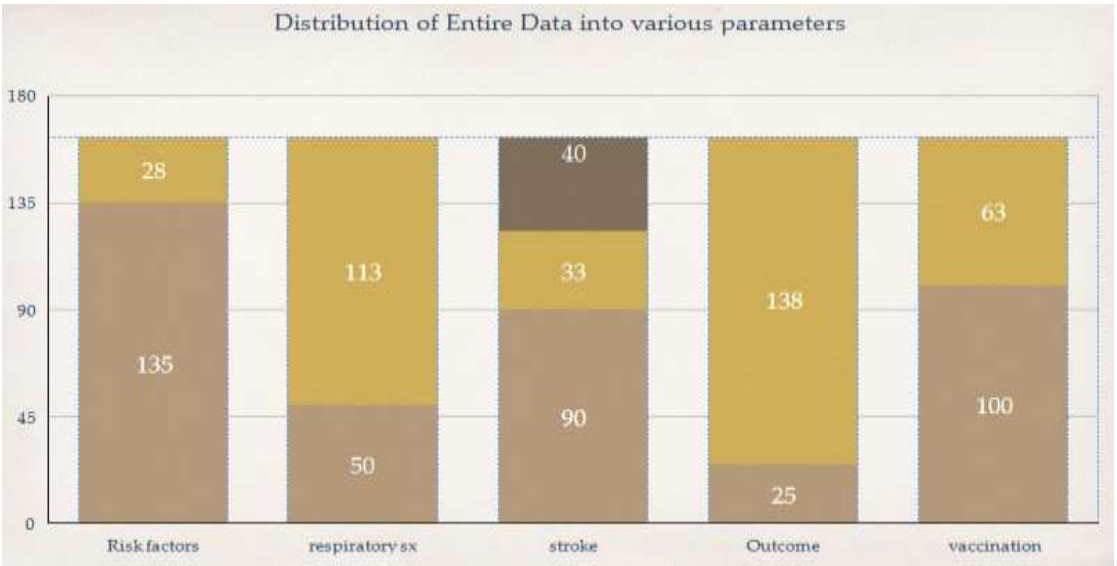

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	Survived	Deceased
H/o covid	4	4
No H/o covid	134	21
Chi-square	7.78	
P value	0.005	

	Large vessel occlusion	Branched vessel occlusion
H/o covid	4	4
No H/o covid	33	122
Chi-square	3.57	
P-value	0.049	

IV. CONCLUSION

- There has been an abrupt eruption of Stroke cases during the months of June, july and early august of 2021 which coincided with peak of second wave of Covid-19.
- The eruption of cases can be attributed to asymptomatic covid infections which was the majority of presentation during the pandemic.
- Covid 19 manifests as large vessel strokes with a greater risk of mortality in a slightly younger age with or without vascular risk factors.
- There also has been a greater incidence of stroke tendency in Covid-19 when compared to other pandemic causing virus such as influenza.
- Detection of covid-19 in the presence of stroke helps us to take precautions measure for contact and droplet nuclei,identify other organ/system involvement,identifying derangements in coagulation tests,weight the risk-benefit for IV thrombolysis with covid-19 infection positivity being a poor prognostic factor.

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