ORIGINAL RESEARCH PAPER

Medicine

PREVALANCE OF NEUROLOGICAL MANIFESTATIONS IN PATIENT WITH COVID-19 INFECTION

KEY WORDS: COVID 19, Neurological symptoms, Cerebrovascular accident,

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ABSTRACT

BACKGROUND: Covid 19 has caused a global pandemic since November 2019. Neurological manifestations also occur in addition to respiratory symptoms and distress. Recently it has been found that the neurological symptoms of covid 19 are also common.

OBJECTIVE: To study the neurological manifestations of patients with covid 19

MATERIALS AND METHODS: In this cross sectional study design, patients admitted in GOVT Kilpauk Medical College ,Chennai with symptoms and signs of Covid 19 infection with laboratory confirmed / CT with informed consent. Neurological examination done by trained neurologist and symptoms were analysed into those involving the central nervous system and peripheral nervous system

RESULTS: Of 349 patients mean SD age,55.14[14.06]; 232 males [66%] with COVID 19 and 117 females [33%], Of 349 patients ,covid positive patients 179 [51.3%] ,covid negative 170 [48.7 %] .The most common symptoms of patients are giddiness 282[80.8%], weakness of limbs 312[89%], myalgia 91 [26%], bells palsy 67 [19%], ataxia 57 [16.3%], seizures 54 [15%] ,loss of taste 37 [10.6%] ,loss of smell 12 [3.4%] ,neck rigidity 10 [2.8%] .The mortality rate of patients ,covid positive with pneumonia 98 cases [58.3%], covid negative 70 [41.7%].

CONCLUSION : Patients with covid -19 commonly have neurological manifestations .

BACKGROUND

COVID 19 caused by severe acute respiratory syndrome corona virus 2 {SARS-COV2} ,has caused a global pandemic since November. Neurological manifestations also occurs in addition to major respiratory distress. Though respiratory manifestations are the dominant presenting features in most patients ,other system involvement does occur .Recently ,it has been found out that some severely affected COVID 19 patients experience neurological manifestations.

The National Health Commission of china issued an updated version of the Diagnosis and Treatment Guidelines for COVID 19 which includes the pathological findings of multiple organs found from autopsy analysis .Pathological changes in the lung, spleen, hilar lymph nodes, heart, blood vessels, liver, gallbladder, kidney, adrenal gland, esophagus, stomach, intestine, brain. Both SARS-COV2 and SARS-COV invade human cells via angiotensin-converting enzymes (ACE), an important component of the renin angiotensin system (RAS) in brain.

AIM OF THE STUDY

To study the 'Prevalence of Neurological deficit in patients with COVID 19'admitted in Govt Kilpauk Medical College Hospital, Chennai, Tamil Nadu, India.

STUDY DESIGN:

Cross sectional study. This is a two centre study involving Govt. Kilpauk medical college and Govt, Royapettah hospital .The patients will receive care determined by covid team comprising of supplementary oxygen , HFNC, invasive ventilation , antibiotics, antiviral agents, vasopressor agents, antiplatelet, statins, when needed based on the presentation if they are covid positive . Neurological care will be dealt by the corresponding physician.

MATERIALS & METHODS

A detailed history was taken from the patients .A confirmed case of COVID 19 was defined as a patients that had a positive (RTPCR) reverse –transcriptase-polymerase –reaction assay for SARS CoV 2 in a nasopharyngeal swab taken by microbiology department and reported here . The medical records history of Diabetes/Hypertension/Coronary artery disease/dyslipidemia / hematological disease/stroke were reviewed. Drug intake for anti hypertensives, anti diabetes,drugs for ischemic heart disease ,drugs for hypercholesterolemia, obtained.

Smoking and alcohol history are also obtained. Patients were risk stratified at op of the hospital according to the symptoms of mild, moderate, severe. Patients without hypoxia or exertional dyspnea were considered as mild COVID and advised home isolation/ quarantine. Patients who presented with infiltrates on chest x-ray/CT chest are considered moderate COVID as they required supplement oxygen by nasal canula or high flow nasal cannula(HFNC) and admitted to the isolation ward with prone ventilation.Patients in severe respiratory distress requiring mechanical ventilation were classified as severe COVID and admitted in the COVID ICU.

INCLUSION CRITERIA

Patients with signs and symptoms of SARS CoV Infection and Neurological symptoms admitted in Govt Kilpauk Medical College, Chennai ,TamilNadu, India.

EXCLUSION CRITERIA

Covid patients with previously acquired neurological deficit

ANALYSIS PLAN

Statistical analysis will be carried out by using IBM SPSS Version **22**

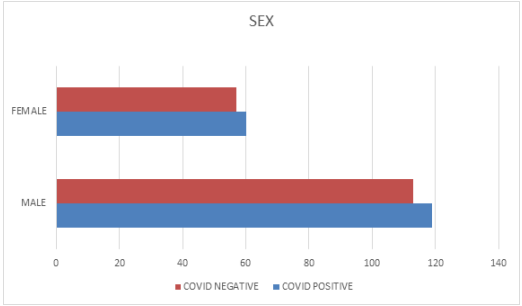
SUBJECT SELECTION:

All patients who are admitted with newly occurring neurological deficits during this COVID 19 pandemic COVID 19 TESTING AND COVID 19 PROFILE done in all patients. chest –ray is mandatory in all patients. CT chest/ CT Brain/ MRI Brain done when necessary. **Routine blood investigations and covid profile was done**

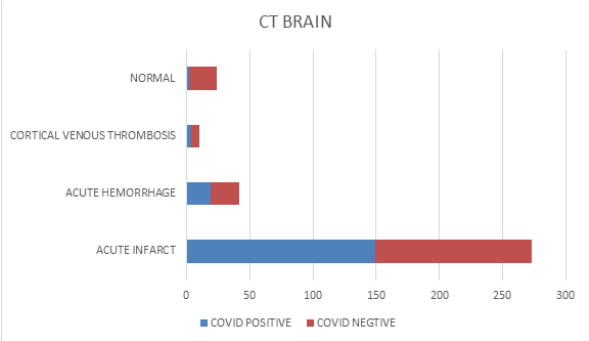
STATISTICAL ANALYSIS

Table : Clinical Characteristics Of Patients With Covid 19

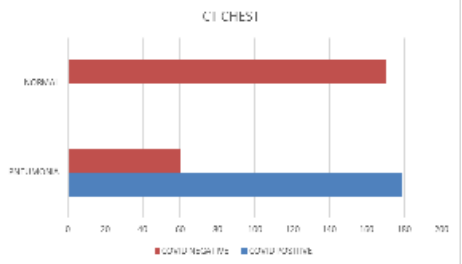
CHARACTERISTIC	TOTAL	COVID NEGATIVE	COVID POSITIVE
AGE ,MEAN ,SD, Y	55		
SEX			
Male	232[66.5%]	113 [48.7%]	119 [51.3%]
Female	117 [33.5%]	57 [48.7%]	60 [51.3%]
COMORBIDITIES			
Hypertension	137 [39.25%]	56 [40.9%]	81 [59.1%]
T2 Diabetes mellitus	94 [26.93%]	41 [43.6%]	53 [56.4%]
Coronary artery disease	43 [12.32%]	20 [46.6%]	23 [53.5%]
Chronic kidney disease	15 [4.29%]	6 [40%]	9 [60%]
Chronic lung disease	21[6.01%]	9 [42.9%]	12 [57.1%]
Hyper homocysteinemia	1 [0.28%]	0	1 [100%]
Buccal carcinoma	1 [0.28%]	0	1 [100%]
SYMPTOMS			
Giddiness	282 [80.8%]	128 [45.4%]	154 [54.6%]
Ataxia	57 [16.3%]	28 [49.1%]	29 [50.9%]
Bells palsy	67 [19%]	45 [67.2%]	22 [40.7%]
Seizures	54 [15 %]	32 [59.3%]	22 [40.7%]
Myalgia	91 [26%]	35 [38.5%]	56 [61.5%]
Taste	37[10.6%]	26 [70.2%]	11 [29.8%]
Smell	12 [3.4%]	3[25%]	9 [75%]
Vision	0	Nil	Nil
Neck rigidity	10 [2.8%]	7 [70%]	3[30%]
Weakness of limbs	312 [89%]	174 [55.8%]	138 [44.2%]
CT CHEST			
NORMAL	110 [31.5%]	110 [100%]	0 [0%]
PNEUMONIA	239 [68.5%]	60 [25%]	179 [75%]
CT BRAIN			
ACUTE HEMORRHAGE	42 [12.03%]	23 [54.7%]	19 [45.3%]
ACUTE INFRACT	273 [78.22%]	124 [45.5%]	149 [54.5%]
CORTICAL VENOUS THROMBOSIS	10 [2.86%]	6 [60%]	4[40%]
NORMAL	24 [6.87%]	2 [7.69%]	22[6.81%]



Crosstab					
			COVIDSTATUS		Total
			NEGATIVE	POSITIVE	
CTBRAIN	ACUTE HEMORRHAGE	Count	23	19	42
			54.7%	45.3%	12.03%
	ACUTE INFARCT	Count	124	149	273
			45.5%	54.5%	78.22%
	CORTICAL VENOUS THROMBOSIS	Count	6	4	10
			60%	40%	2.86%
	NORMAL	Count	2	22	24
			8.3%	91.7%	6.87%
Total		Count	323	26	349



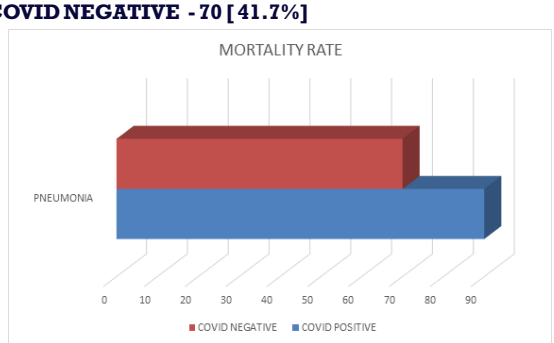
CTCHEST * COVIDSTATUS Crosstabulation					
			COVIDSTATUS		Total
			NEGATIVE	POSITIVE	
CTCHEST	NORMAL	Count	110	0	110
			100%	0.0%	31.5%
	PNEUMONIA	Count	60	179	239
			25%	75%	89%
Total		Count	170	179	349
			100%	7.4%	100.0%



MORTALITY RATE :

COVID POSITIVE - 98 [58.3%]

COVID NEGATIVE - 70 [41.7%]



RESULTS :

Demographic :

Of 349 patients admitted in neurology ward mean age, was 55.14[14.06];232 were males [66%] and 117 women [33%]. Of 349 patients ,covid positive patients 179 [51.3%] ,covid negative 170 [48.7%] .

Clinical manifestations :

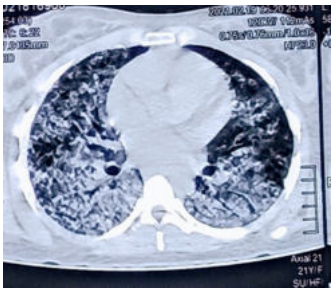
The most common symptoms of illness presentation giddiness 282[80.8%], myalgia 91 [26%],loss of taste 37 [10.6%], loss of smell 12 [3.4%] .The most common CNS

manifestation of presentation was weakness of limbs 312[89%], bells palsy 67 [19%], ataxia 57 [16.3%], seizures 54 [15%] ,neck rigidity 10 [2.8%] The mortality rate of patients ,covid positive with pneumonia 179 cases [51.3%], covid negative 170 [48.7%]. The most common underlying co morbidities of these patients were hypertension 137 , type 2 diabetes mellitus 94, coronary artery disease 43 ,chronic kidney disease 15 , chronic obstructive lung disease 21 ,hyper homocytenemia 1 ,carcinoma of buccal mucosa 1

Investigations :

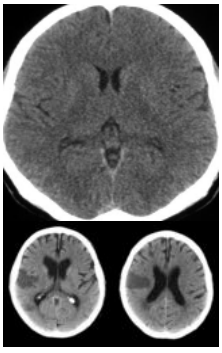
CT CHEST:

CT chest was done for all the patients of 349 , CT chest was normal for 170 patients , CT chest pneumonic changes for 179 patients among them 170 patients are covid test negative and 179 patients are covid test positive .



CT BRAIN :

CT brain was done for all the 349 patients , CT brain shows acute hemorrhagic infarct for 42 patients among them, 40 patients are covid test negative ,2 patients are covid test positive .CT brain shows Acute infarct presents in 273 patients , among them 251 patients are covid test negative , 22 patients are covid test positive and cortical venous thrombosis presents in 10 patients ,among them 10 patients are covid test negative ,and normal CT brain for 24 patients among them 22 patients are covid test negative and 2 patients are covid test positive.



MRI BRAIN :

MRI brain was done for selective patients only , acute infract presents in 104 patients among them 12 patients are covid test positive and 92 patients are covid test negative . Cortical venous thrombosis presents in 8 patients among them 8 patients are covid test negative.

DISCUSSION :

Current published studies have suggested that neurological involvement in the pathogenesis of SARS– CoV– 2 does seem to be associated with a more "severe" infection and subsequent mortality. However currently, no direct cause and effect has been attributed to neurological deterioration in patients with SARS– CoV– 2 and this relationship could just as plausibly be explained by association with other multi– organ system failures. The direct effect on mortality and morbidity in such "neurological involving" patients is yet to be elucidated.

Interestingly, peripheral nervous system involvement by way of anosmia has been shown to be the initial presentation of SARS– CoV– 2 in 36% of patients a recent Spanish case– control study. These so– called smell and taste disorders (STD) were found to be significantly more prevalent in SARS– CoV– 2 patients than in influenza patients. 28 This opens the possibility of more prompt isolation of suspected cases and control of the pandemic if the typical symptoms of fever and cough are indeed preceded by anosmia, even if only for a select group of people.

CONCLUSION :

- Acute Hemorrhagic cerebrovascular accident - 12.03% of patients with Covid 19
- Acute ischemia infarct cerebrovascular accident - 78.22% of patients with Covid 19
- Acute Cortical venous thrombosis - 2.86% of patients with Covid 19
- Normal study in 6.87% of patients with Covid 19

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