

Incidence of stroke in a population affected by COVID-19 in Veracruz, México

Dear Editor,

One of the main complications of COVID-19 is the thrombotic events reported with different incidences in the different case series, although those of the central nervous system are rare.

A meta-analysis carried out on more than 108,500 patients showed a low incidence of stroke in patients with COVID in the order of 1.4%, despite being a population with important cardiovascular risk factors; another systematic review and meta-analysis carried out in 26,691 patients showed an incidence of ischemic stroke of 2%. There was a 1.48% stroke rate across 119,967 COVID-19 hospitalizations.^[1-3]

In the Philippines, the incidence of stroke among patients with COVID-19 was 3.4% ($n = 367$). In the Mexican Registry of Neurological Manifestations in Patients with Confirmed COVID-19, the incidence of stroke was reported to be 19%. Cerebrovascular insults were the most common severe neurologic manifestations. Most countries in Latin-American (Argentina, Brasil, Chile, Colombia, Peru y Paraguay) reported mild decreases in all-type stroke admissions during the COVID-19 period, except Mexico, where admissions significantly increased in 2020, probably due to a redistribution of admissions to hospitals classified as non-COVID-19 centers.^[4-6]

Some authors suggest in the pathogenesis the presence of hypercoagulable states associated with COVID and manifestations due to the elevation of markers such as D-dimer, fibrinogen, ferritin, and thrombocytopenia.^[7]

To identify the incidence of stroke in patients affected by COVID-19 in Veracruz, Mexico, from April to October 2021, we made a descriptive and retrospective study, in which strokes presented by patients who suffered from COVID-19 are analyzed.

Data from 1,212 patients diagnosed with COVID-19 are included from a single hospital center, making the diagnosis of COVID-19 using polymerase chain reaction-reverse transcription or COVID antigen test, 641 (53%) men and 571 (47%) women, with a mean age of 49 years. 663 (54.7%) patients suffered from some chronic disease, systemic arterial hypertension was the most common comorbidity (29.2%), followed

by diabetes (29.1%), obesity (13.9%), cardiovascular disease (5.4%), asthma (4.5%), chronic kidney disease (3.8%), and COPD (2.1%). The most frequent neurological symptoms were headache (83%), anosmia (75%), dysgeusia (75%), myalgia (68%), and somnolence (50%). This high incidence of neurological symptoms speaks of the high neurotropism of the virus and its predilection for frontal involvement, which explains many of the reported symptoms and for which there is already reported evidence.^[8]

Regarding the presence of stroke, whose diagnosis was made by clinical picture corroborated by simple cranial computed tomography, we found two cases of stroke, one case of retinal artery thrombosis right eye, and three cases of transient cerebral ischemia without repercussion reported, all presented in the acute stage of COVID-19; the patients who presented cerebral vascular events associated with COVID-19, 50% were female, with an average age of 52 years. About 67% presented the triad of diabetes, hypertension and obesity. He highlighted that the more severe the neurological involvement, the greater the inflammation and thrombotic risk data documented; 83% had a good prognosis [Table 1]. Taking into account the population of the state of Veracruz, which is 8,062,579 inhabitants in 2021, the incidence of cerebrovascular thrombotic events is 0.6 cases per million inhabitants.

We consider that the incidence of stroke is low even though more than half of the patients presented some chronic comorbidity, highlighting the presence of arterial hypertension, diabetes, and obesity, despite this the events of stroke were of low incidence and there were others related, such as transient cerebral ischemia that stands out in the same way.

We also consider that the hospital conversion due to the COVID-19 pandemic affected the diagnosis and treatment protocols of other entities such as stroke, which could at some point reduce the detection of said entity and other non-COVID diseases, which could be reflected in a low incidence of cases.

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Conflicts of interest

There are no conflicts of interest.

Table 1: Characteristics of the identified cases

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Age	65	70	48	43	55	35
Gender	Female	Male	Female	Male	Female	Male
Comorbidities	Diabetes	Diabetes	None	Diabetes	Diabetes	None
	Hypertension	Hypertension		Hypertension	Hypertension	
	Obesity	Obesity		Obesity	Obesity	
Type of vascular event associated with COVID	Stroke	Stroke	Retinal artery thrombosis right eye	Transient cerebral ischemia	Transient cerebral ischemia	Transient cerebral ischemia
D-Dimer (ng)	1000	2200	800	500	340	320
Ferritin (mg)	1800	3300	1230	800	980	580
Affected vessel	Right middle cerebral artery	Right middle cerebral artery	Retinal artery right eye	None	None	None
Affected circulation	Frontal, parietal and temporal	Frontal, parietal and temporal	Vasa vasorum optic nerve	Carotid and vertebrobasilar	Carotid and vertebrobasilar	Carotid and vertebrobasilar
Prognosis	Good	Bad	Good	Good	Good	Good

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