



COVID-19 as a Risk Factor for Ischemic Stroke, A Case Report, Khartoum, Sudan, 2020

Amira Sidig¹, Mazin Salah-Eldien², Khabab Abbasher Hussien Mohamed Ahmed^{2*}, Hussien Abbasher³, Radi Tofaha Alhousseini², Mohammed Abbasher⁴ and Abbasher Hussien⁵

¹Associated Professor of Community Medicine, Al Neelain University, Faculty of Medicine, Khartoum, Sudan

²MBBS Student, University of Khartoum, Faculty of Medicine, Khartoum, Sudan

³MBBS Student, ALYarmouk College, Khartoum, Sudan

⁴MBBS Student at Al Neelain University, Faculty of Medicine, Khartoum, Sudan

⁵Professor of Neurology, University of Khartoum, Faculty of Medicine, Khartoum, Sudan

*Corresponding Author: Khabab Abbasher, MBBS Student, University of Khartoum, Faculty of Medicine, Khartoum, Sudan.

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Abstract

Introduction: Covid-19 is associated with common neurological diseases including stroke.

It is believed that COVID-19 can cause hypercoagulability status which can induce thrombotic events which may predispose for stroke.

Objective: To document COVID-19 as a risk factor for Ischemic Stroke.

Case Report: A 62 years Sudanese male known diabetic, hypertensive, hypercholesterolemia, presented to the casualty with left sided weakness. Full medical history and physical examination was done, routine and specific investigations were done.

Result: The patient, presented with left sided weakness, started suddenly. Both left upper and lower limbs were affected at the same time. He became completely paralyzed within less than six hours. Deviation of the mouth to the right side is noted. Physical examination revealed weakness in the left side of the body (left upper and lower limbs) where the power was grade zero in both limbs plus hypotonia and areflexia. Laboratory investigations were: Complete hemogram rather than lymphopenia no abnormalities were detected, ECG: left ventricular hypertrophy plus left axis deviation, Chest X-ray showed evidence of cardiac enlargement and mid zonal pneumonia, chest showed evidence of bilateral ground glass appearance. Test for COVID-19 was positive, CT brain showed an evidence of right Cerebral infarction, D-dimer is elevated, C-reactive protein: 16.2mg/dl.

Conclusion: Strokes are being reported as a complication of COVID-19 due to the hypercoagulability state induced by Covid-19 infection.

Keywords: Covid-19; CT Brain; Chest X-ray

Introduction

Corona viruses cause diseases in mammals and birds. Human to human transmission of corona viruses occur among close con-

tacts via respiratory droplets by sneezing and coughing [1]. Symptoms are fever, sore throat, cough, shortness of breath, diarrhea and generalized fatigability. Complications include: Acute distress

respiratory syndrome, myocarditis, heart failure, renal failure and recurrent attacks of pulmonary embolism. It can present with neurological manifestations such as: loss of taste and smell, headache, dizziness, peripheral neuropathy, encephalitis, convulsions and stroke [2,3].

Cerebrovascular accident is a disease of the brain vessels, it includes:

- Cerebral hemorrhage and cerebral infarction (stroke).
- Subarachnoid hemorrhage.
- Subdural hematoma.
- Extradural hematoma.

Stroke is the most common neurological disorder. It's the third killer worldwide and of the commonest causes of disability [4]. There are two main types of stroke: Ischemic stroke (constitute 85%) and hemorrhagic stroke (constitute 15%). Headache, convulsions and loss of consciousness commonly occur with hemorrhagic stroke, and massive infarction. The clinical manifestations depend on which part of the circle of Willis is affected [5]. An example of stroke is involvement of the posterior limb of the internal capsule which is supplied by the lenticulostriate artery, a branch of the middle Cerebral artery. Patients will develop sudden attack of unilateral weakness and ipsilateral upper-motor neuron lesion facial palsy. When the symptoms and signs disappear within less than 24 hours, this is called TIA, and when the symptoms and signs reach maximum intensity within less than 24 hours this is a complete stroke. The stroke will be incomplete when there is progressive worsening of the condition. The main risk factors for the stroke include hypertension, diabetes, hyperchloremia, obesity and smoking [6,7].

Case Report

A 62 years Sudanese male was known to have diabetes mellitus, hypertension and hypercholesterolemia. He was brought to the casualty with left sided weakness. The condition started suddenly. Both left upper and lower limbs were affected at the same time. He became completely paralyzed within less than six hours. The condition was not preceded by headache, convulsions or loss of consciousness. There were no symptoms in favor of cranial nerves involvement rather than deviation of the mouth to the right side. He had no chest pain, palpitations or dyspnea. He had no cough, nausea, vomiting, abdominal pain or urinary incontinence. Also he had no joint pain or skin rashes. His wife mentioned that two

days prior to admission he started to complain of loss of taste, sore throat and intermittent high grade fever and for that he was given anti-malarial without response. The patient has no family history of similar condition and has no past history of transient neurological deficits. He used to take lisinopril 10mg per day for hypertension, Glimepiride 4mg per day plus metformin 500mg bid for diabetes and atorvastatin 40mg for hypercholesterolemia.

Examinations

He looked ill, febrile (38c), wasn't pale, jaundiced nor cyanosed. Pulse was 100/minute, of good volume not collapsing and synchronous. Vessels were palpable and there was no radio femoral delay. Blood pressure was 130/80 mmHg. There was no carotid bruit. The rest of the cardiovascular examination revealed no abnormalities. On chest examination respiratory rate was 16/minute. The two sides of the chest were moving equally. The pattern of breathing was mainly thoracoabdominal. Chest expansion was normal. Trachea was central. Apex beat was in the fifth intercostal space, in the midclavicular line with normal character. Tactile vocal fremitus and percussion were normal. Auscultation revealed bilateral harsh vesicular breathing mainly over the mid zones. Abdominal examination revealed no abnormality. On CNS examination he was fully conscious, oriented in time, person and place. Both recent and remote memories were intact. Cranial nerves examination revealed no abnormality except for fundus examination revealed evidence of bilateral simple background diabetic retinopathy and left sided upper motor neuron lesion facial palsy. He had no neck stiffness. The rest of the abnormalities were confined to the left side of the body (left upper and lower limbs) where the power was grade zero in both limbs plus hypotonia and areflexia with intact all modalities of sensation including light touch, pinprick, vibration and position. Coordination could not be demonstrated on the left side due to the remarkable weakness.

Investigations

- Urine was clear
- Blood urea and serum creatinine were normal.
- Sodium and potassium were normal.
- Complete hemogram rather than lymphopenia, no abnormalities were detected.
- Liver function test was normal.
- ECG: left ventricular hypertrophy plus left axis deviation.
- Chest X-ray showed evidence of cardiac enlargement and mid zonal pneumonia.

- Echocardiography showed evidence of ischemic heart disease.
- Serum cholesterol was normal.
- CT-chest showed evidence of bilateral ground glass appearance.
- Test for COVID-19 was positive.
- CT brain showed evidence of right Cerebral infarction.
- D-dimer is elevated.
- C-reactive protein: 16.2mg/dl.

Discussion

Stroke is a medical emergency associated with high mortality and morbidity. It's one of the most common causes of disability, especially among elderly. By now it's clear that COVID-19 is not just a respiratory disease. In addition to the serious complications like acute respiratory distress syndrome, recurrent attack of pulmonary embolism, patients with COVID-19 can present with myocarditis and heart failure. Also patients with COVID-19 can present with neurological manifestations like loss of taste and smell, epilepsy, encephalitis, myopathies, peripheral neuropathies and stroke. Data from COVID-19 outbreak in China revealed the incidence of stroke among COVID-19 hospitalized patients was 5% [8]. Stroke among patients with COVID-19 can affect any age (young and elderly) although the incidence of stroke increases among patients with severe disease like hypertension, diabetes, coronary artery diseases and previous attack of cerebrovascular accident [9]. Until now there is no clear link between COVID-19 and Stroke, but there are many hypotheses that can explain the occurrence of stroke among patients with COVID-19. One of these hypotheses is that: COVID-19 is an acute inflammatory condition associated with increased incidence of fatty plaques formation and injury of endothelial cells of the vascular wall [10]. Coagulopathy and vascular endothelial dysfunction have been proposed as complications of COVID-19. High levels of C-reactive protein and D-dimer indicate active inflammatory process and hypercoagulability respectively. The coexistence of inflammation, hypoxia and hypercoagulability can lead to formation of micro and macro thrombi in the vessels. So patients with COVID-19 are at increased risk of venous thromboembolization leading to cerebrovascular accident [11]. COVID-19 can attach to angiotensin converting enzyme -2 receptors and this can explain the entry of the virus into the nervous system causing direct damage to the blood vessels [12]. Further studies are needed to clarify the relation between stroke and COVID-19.

Conclusion

We found that COVID-19 infection can be a great risk factor for Ischemic Stroke, especially in elderly.

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