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Case Report

Cerebral Venous Thrombosis Post COVID 19 in Neurological Unit of Fann Teaching Hospital, Dakar – Senegal

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Abstract: *Introduction*: The new coronavirus constitutes a public health problem due to its many often fatal complications such as thromboembolic diseases. Upper this infectious state, neurological diseases are reported mainly ischemic stroke and rarely cerebral venous thrombosis. *Observation*: We report the case of a 76-year-old diabetic, hypertensive patient who was well monitored and who presented neurological manifestations 24 hours after home returning from hospitalization for COVID 19 infection fifteen days before. Major signs were dehydration grade I according to the WHO, confusional syndrom, left pyramidal syndrom of cortical type predominantly on facial and arm and regular tachycardia. The brain imagery revealed a double thrombus in sinus and diagnosis of cerebral thrombosis (CVT) was made. Biological abnormalities were noted, such as neutrophilic hyperleukocytosis and thrombocytopenia. The evolution was favorable with symptomatic treatment and after putting on oral curative dosis anticoagulant. *Conclusion*: Cases of cerebral venous thrombosis are increasingly reported in the literature, but Cases of CVT in the field COVID 19 remain rare, especially in Africa. Elderly age and vascular risk factors could favorite occurrence of cerebral venous thrombosis in cases of Sars-Cov infection. It is important to think about it in the face of any brain neurological picture given the thrombogenic nature of COVID 19, mainly in geriatric population. However, guidelines must been done for better management of these patients even if outcomes evolution are generally favourable.

Keywords: Cerebral Venous Thrombosis, New Coronavirus, Anticoagulant, Neurology, CHU Fann, Dakar, Senegal

1. Introduction

COVID-19 is a viral disease caused by the novel coronavirus, SARS-CoV-2, and is considered as pandemic by the World Health Organization. It is a serious pathology that can quickly become life-threatening due to severe respiratory distress. It is considered as a systemic disease that can cause vasculitis and thromboembolic disease. SARS-CoV-2 infection appears to have a brain tropism involving several pathophysiological mechanisms, including direct cellular toxicity and neuroinflammation induced by the systemic response to infection [1].

Thus, the thromboembolic mechanism in COVID 19 is multifactorial, we note: On the one part the existence of risk factors such as age, obesity, bed rest, hypoxemia, active neoplastic pathology or venous insufficiency. On the other hand, a phenomenon of immuno-thrombosis, namely damage to the vascular endothelium and disseminated intravascular coagulation (increase in D-Dimer and fibrinogen levels, moderate thrombocytopenia, a decrease in prothrombin (TP) levels and a prolongation of activated partial thromboplastin time (aPTT).

A high incidence of venous thromboembolism (VTE) ranging from 7.7 to 28.0% in patients hospitalized with

COVID-19-associated pneumonia has been reported despite sometimes appropriate VTE prophylaxis [2, 3] however a few series of cases of cerebral venous thrombosis have been reported in patients with COVID 19 and the publications in Africa do not remain any more. We report a case of multiple venous thrombosis in a patient monitored for COVID 19.

2. Observation

76-year-old diabetic patient, known hypertensive and well-monitored, with a history of COVID19 pneumonia diagnosed 12 days before admission. Who presented twenty-four hours after the negativity of his RT-PCR the sudden onset of apparently generalized tonic-clonic convulsive seizures, behavioral disorders such as psychological agitation and a left hemi corporal deficit.

The constants on admission showed hypertension at 16/09 mmHg, a temperature at 36°3 C, a tachycardia at 105 beats/min and a capillary blood sugar at 3.15g/l. On examination, the patient was in fairly good general condition with well-colored mucous membranes, supple calves, dehydration grade I according to the WHO, confusional syndrom, left pyramidal syndrom of cortical type with predominantly facial arm (3/5 at upper limb and 4/5 in the lower limb) and regular tachycardia. The lung fields were free of added noise and the rest of the examination was unremarkable.

The blood count showed hyperleukocytosis at 19 100,000 with a neutrophil predominance, thrombocytopenia at 116,000 (N: 150 -450 10 ^{3}), fasting blood sugar was at 3.38 gl /l with HbAC at 7.7%, CRP elevated at 48 mgl /l, blood ionogram and lipid profile were normal. Retroviral serology was negative.

The brain scan revealed a defect in the anterior arm of the right internal capsule and the brain MRI showed a thrombosis of the right sinus and superior sagittal sinus (Figure 1. AngioMRI).

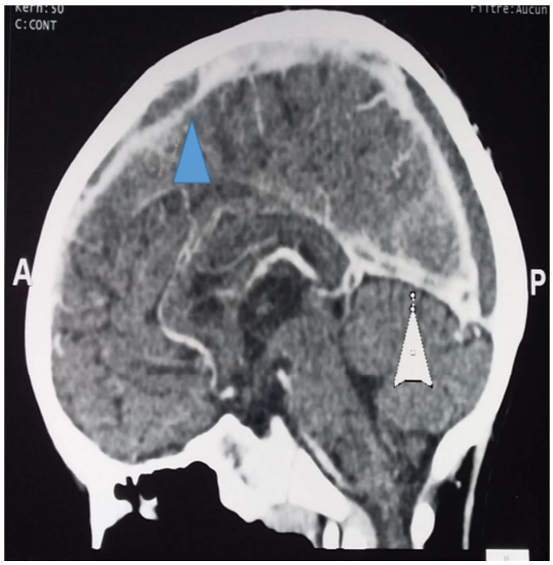

Figure 1. *Angio MRI. Thrombosis of the right sinus (white arrow) and the superior sagittal sinus (blue arrow): absence of opacification of the sinus.*

His chest CT scan during the pneumonia showed a diffuse ground glass image appearance estimated at 50% of parenchyme (Figure 2. Chest CT).

Patient was placed on low molecular weight heparin at an effective dose (0.6 mg prolonged release carbamazepine 200 mg/24 hours, paracetamol 3g/24 hours and motor physiotherapy. The clinical evolution was favorable with cessation of attacks, glycemic control and motor recovery.

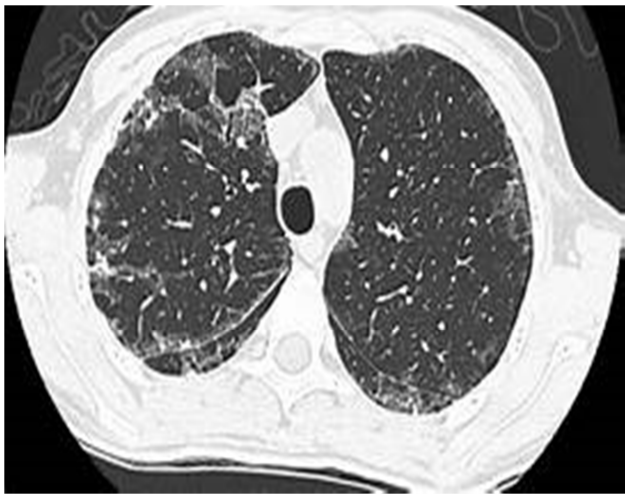

Figure 2. *Ground glass appearance on chest CT.*

3. Discussion

Cases of CVT in the field COVID 19 remain rare, especially in Africa; Bouguila et al reports 2 cases out of a series of 15 neuroCOVID in Tunisia [4]. Coagulation disturbances are frequently described in patients with coronavirus disease 2019 as well as thrombotic clinical events and this by many mechanisms. First, D-dimer, fibrinogen, and fibrin breakdown products are known to be elevated compared to healthy subjects [1]. Additionally, SARS-CoV-2 interaction with the ACE receptor can lead to injury thereby promoting a hypercoagulable state [5]. Added to this are the risk factors favoring thromboembolic disease.

Our patient had cardiovascular risk factors such as age, diabetes and high blood pressure. It should be noted that the majority of patients diagnosed with CVT in the context of COVID 19 were middle-aged and without significant comorbidities and the risk factors encountered were obesity, prostate tumor or smoking [6]. But it should be noted that this neurological symptomatology mainly affects patients over 60 years of age [7].

In our patient and in several cases reported in the literature, COVID-19 infection preceded the symptoms of venous thrombosis for up to two weeks [6, 8]. Apart from strokes, most neurological manifestations appear early (two to four days after the onset of infectious symptomatology) [7, 10-12]. She presented clinically with respiratory signs 12 days before the appearance of neurological symptoms such as confusional syndrome, convulsive seizures and motor deficit. The main neurological signs reported in the literature were disturbances of consciousness, aphasia, seizures and

motor deficits [6, 8]. In an English study of 153 patients, 77 (62%) of the 125 patients with complete clinical data who had a cerebrovascular event, including 57 (74%) an ischemic stroke, nine (12%) intracerebral hemorrhage and one (1%) vasculitis. Thirty-nine (31%) of the 125 patients presented with impaired alertness, including nine (23%) with have non-specific encephalopathy and seven (18%) have encephalitis. The remaining 23 patients (59%) met psychiatric case definitions, of which 21 (92%) developed de novo [7, 11].

On the biological level, D- dimers, fibrinemia, coagulation proteins were not measured in our patient, however we noted moderate thrombocytopenia and an elevation in CRP, which is similar to the data from the literature. Indeed, central nervous system involvement would therefore be more frequent in the following forms in patients with abnormalities more often biologics: lymphopenia, thrombocytopenia and elevation of urea [10, 12]. Circulating anticoagulant (CCA) is described as a prothrombotic factor. Some authors report the presence of anti-phospholipid antibodies in certain patients with CVT in a context of COVID 19 [6, 9], the anti-phospholipid antibody assay was not performed in our patient.

Brain MRI made it possible to demonstrate thrombosis in the superior longitudinal sinus and the right lateral sinus. It is an essential examination in the diagnosis of cerebral venous thrombosis. In the literature we note more involvement of the transverse sinus than the longitudinal sinus or the sigmoid sinus and this without particular explanations [13, 6, 8].

The treatment of venous thrombosis is threefold: anticoagulant, symptomatic and etiological treatment. Given the unavailability of effective etiological treatment to date, our patient benefited from treatment based on low molecular weight heparin and Acenocoumarol. This treatment is consistent with literature data [6, 8]. However, there is no consensus on the choice of anticoagulant and the optimal duration of treatment for cerebral venous thrombosis [14], especially if it is associated with COVID 19 [15]. While treating patients of severe COVID-19 with parenteral anticoagulants, vigilant watch must be need against the development of heparin induced thrombocytopenia [16]. Thus, a large multicentre controlled trials are needed to build up a consensus guideline regarding treatment plan of CVT associated with SARS-CoV-2 infection. [16]

Venous thrombosis is higher in patients with severe forms of SARS-COV2 and the outcome is most often fatal [6, 8]. In our patient we noted a good improvement with motor recovery (5/5 according to MRC), the cessation of seizures and the remission of psychomotor agitation. Ghosh and al [16] had observed that those individuals who did not have one or more inherited or acquired risk factor(s) for CVT, outcome with therapy was better compared to others whose genetic and pre-existing acquired thrombophilia profile were unknown. In its geriatric population, Khattab et al, reported a short-term mortality rate of 12.6% (28/222). There were 57 patients with acute stroke, of whom 13 (22.8%) had multiterritorial ischemic stroke, with large vessel thrombosis in 16 (28.1%). [17]

4. Conclusion

COVID 19 is a systemic disease that can quickly become life-threatening in the short and long term due to its numerous complications. Neurological complications are described and cerebral venous thrombosis nonetheless remains. Neurological symptomatology mainly affects patients over 60 years of age. Thus, it is necessary to think about cerebral venous thrombosis in the face of any focal neurological symptom in the context of known SARS Cov infection in an elderly subject. Direct accountability is difficult to establish but its role as a risk factor or even a potentiation factor in certain areas is almost certain. As reported by Ghosh et al [16] in his review, there are no clinical specificities or actual pathophysiological differences in the occurrence of CVT on this SARS-CoV viral infection ground apart from the action of ACE and the triggering of autoimmune cascades. Guidelines, such as a specific therapeutic protocol needs to be built, for the benefit of us, developing countries.

Disclosures

All authors report no disclosures relevant to the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

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