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Case Report

Covid-19 Infection and Meningoencephalitis in Pregnancy: A Case at the Douala Gynaeco-obstetric and Pediatric Hospital of Douala

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Abstract

A 25-year-old expecting patient, G4P3 003, with no known pathological history, was referred to us for status epilepticus progressing for 2 days, on a pregnancy of 34 weeks of amenorrhea + 5 days, in a context of unspecified fever, without an increase in blood pressure (BP = 104/63 mmHg). The physical examination shows stiff meninges and post-critical coma with an estimated Glasgow score of 8/15 modified by aphasia, and vaginal examination is normal.

The biological assessment made on admission shows a normal blood count, ketonuria at 150 mg (+++) without proteinuria on the urine test strip. D-dimers, LDH and procalcitonin are high. An emergency obstetric ultrasound and brain CT scan are normal. Real-time PCR on a nasopharyngeal swab for COVID-19, routinely performed on admission in the context of a pandemic, revealed the presence of SARS-COV-2 RNA. The diagnostic hypotheses put forward were non-typical eclampsia, cerebral thrombophlebitis or meningoencephalitis in an active pregnancy associated with the COVID-19 disease. The management consisted of an emergency cesarean, a treatment protocol for COVID-19, an anticonvulsant and physiotherapy. The clinical progression was very satisfactory after 7 days. It is important to draw the attention of practitioners to the polymorphism of COVID-19 in vulnerable areas such as that of pregnant women.

Keywords: COVID-19; Meningoencephalitis; Pregnancy

Introduction

The 2019 novel coronavirus (SARS-CoV-2) infection identified in China in December 2019 as the cause of pneumonia cases quickly spread around the world [1]. The World Health Organization (WHO) named it as COVID-19, which stands for coronavirus disease 2019 [2] and identified it as a pandemic, to highlight the seriousness of the situation and to urge all countries to take action to detect the infection and prevent its spread [1]. It is widely

considered that pregnant women are more susceptible to respiratory tract infections, than the general population [3,4]. They may be more vulnerable to COVID-19, due to the physiological immunosuppression that characterizes pregnancy, and are generally susceptible to viral infections and have a higher risk of developing a more severe form [4,5]. However, there are some inconclusive data reporting the effect of COVID-19 on the outcome of pregnancy [6]. The COVID-19 pandemic has exhibited many diagnostic challenges and uncertainties [7]. The clinical manifestations of COVID-19 in pregnant women are reported to be similar to those in the general population [3] but, little is known about the common conditions complicating pregnancy and how their response is changed by the presence of SARS-CoV-2 [7]. Pregnancy in itself, can alter the body's response to a viral infection, which can cause more severe symptoms [7]. We present the case of meningoencephalitis in a pregnant woman with COVID-19 treated at the Douala Gynaeco-Obstetric and Pediatric Hospital. The objective of this presentation is to draw the attention of practitioners on the polymorphism of COVID-19 in vulnerable areas such as pregnancy, where the maternal and fetal prognosis could quickly be engaged.

Clinical Presentation

25year old pregnant woman, G4P3 003, with no known pathological history, referred from a local health center, for repeated convulsive attacks for 2 days, at 34 weeks of amenorrhea + 5 days based on the ultrasound findings, in the context of an unspecified fever and without elevation in blood pressure. Physical examination on admission reveals an altered state of consciousness, Glasgow score assessed at 8/15 subject to aphasia, colored conjunctivae, neck stiffness, the cardiopulmonary examination is normal. Abdomen distended by a gravid uterus, and no lower limb edema. A urinary catheter in place, brought back 100 ml of concentrated urine. Vigorous osteotendinous reflexes in all four limbs, impassive skin-plantar reflexes, and neck stiffness. No uterine contraction is objectified. On vaginal examination: cervix 50% effaced, admitting a finger, intact membranes, cephalic presentation, 5/5 descent, the finger cot brings back a mucous secretion. Vital parameters: BP: 104/63mmHg, Pulse: 93ppm, SpO2: 98% in ambient air, T °: 38.5°C, fundal height: 25cm, BDCF: 139-145 bpm (on doppler).

Morphological assessments

An emergency obstetric ultrasound objective a monofetal pregnancy with foetal growth at the 40th percentile without any anomaly of the umbilical Doppler spectrum. The foetal weight is estimated at 2750 +/- 400 grams, the placenta is posterior and amniotic fluid in sufficient quantity.

Figure 1: Normal umbilical Doppler (a); measurement of biparietal diameter and cephalic perimeter, normal morphology of the cephalic end (b); abdominal circumference (c) and measurement of the length of the femur (d).

A brain CT scan with and without contrast injection was normal.

Figure 2: Computed tomography of the brain in axial cuts: (a) without injection of contrast product; (b) with injection of contrast product. Normal appearance.

Given the epidemiological context of the COVID-19 pandemic, rapid antigenic and serological screening tests for COVID-19 carried out were positive for IgG and IgM.

A Real-time RT-PCR on a nasopharyngeal swab for COVID-19 will subsequently reveal the presence of SARS-COV-2 RNA.

Complementary morphological assessment

Thoracic CT scan which presents lesions of pneumonia predominantly subpleural, with 10% lung involvement of COVID-19.

Figure 3: Chest CT scan without contrast in the parenchymal window (a) in axial cut and (b) coronal reconstruction, showing bilateral ground glass opacities, predominantly subpleural, in particularly on the lower regions.

Long-term EEG (Figure 4): background rhythm of the alpha frequency band 9-10 Hz, symmetrical, synchronous, reactive with the opening of the eyes, absence of paroxysmal activities, PNH and SLI without effect. Conclusion: normal EEG tracing.

Figure 4: Image of a normal EEG tracing.

Biology report

- A normal complete blood count: WBC: 5000/mm^3, HGB: 11g/dl, MCHC: 32pg, MCV: 83.2fl, platelets: 137,000/mm^3
- Normal renal function: BUN: 0.38g/l, blood creatinine: 7.4mg/l,
- A urine test strip which reveals: ketonuria at 150 mg (+++), nitrites (+), without proteinuria or leukocyturia,
- Liver function AST: 13.8 IU/L - ALT: 14.8 IU/L - LDH: 805.33 - Gamma-GT: 26.5 IU/l, Fasting blood sugar: 1.16g/l - Uricemia: 56.1mg/l - CRP: 42 mg/l - PCT: 8.98ng/l
- Dimers: 1000 ng/ml
- PT hemostasis assessment: 100% - TCA: patient: 29.7 sec - control: 33.
- 6CSF analysis: Proteinorachia at 1.3g/l - Normoglucorachia: 0.55g/l, White blood cells> 104, Red blood cells> 106, Soluble antigens negative, Indian ink negative, Bacteriology negative.

In a nutshell: 25-year-old patient with an evolving pregnancy of 34 weeks and 05 days of amenorrhea, coming for an altered state of consciousness in whom the clinical examination revealed:

- Pyramidal syndrome of the 4 limbs
- Meningeal syndrome
- Cortical irritation syndrome
- Infectious meningeal syndrome

In a COVID-19 positive patient.

The diagnostic hypotheses suggested were:

- Atypical eclampsia (without elevation in blood pressure, without proteinuria)
- Cerebral thrombophlebitis
- Pregnancy meningoencephalitis associated with COVID-19.

The initial management consisted of:

- An uncomplicated emergency cesarean section under general anesthesia, with extraction of a live male baby, Apgar score 7/10 then 8/10 and 10/10, weighing 2800g who was transferred to the neonatal unit for surveillance and monitoring according to local protocol.
- Medical care at the ICU made up of: Parenteral rehydration, analgesia, antibiotic therapy, anticoagulation, anticonvulsant, gastric protector, utero-tonic, local Covid-19 protocol (confers annex), oxygen therapy and physiotherapy.

Followed Clinical evolution

On D2 postoperative by:

- Amendment of convulsive seizures
- A slight improvement in the state of consciousness, Glasgow 9/15
- Apyrexia T °: 37°C.

On D7, complete recovery of the motor deficit. The patient stands on her two legs, has walking autonomy, Glasgow at 15/15. Stable hemodynamic parameters, no complaints.

The patient had remarkable clinical and paraclinical recovery. She was released from intensive care, transferred to the isolation area for patients with minor forms of COVID-19. His Covid-19 treatment was continued until D10 according to the recommendations of the local management protocol (see appendix).

The prognosis for the child and for the mother was very favorable.

Follow up:

- A PCR done on Day 21 after discharge from intensive care was negative and the patient was declared cured of the COVID-19 infection.
- Counseling given to the couple on the interest of a monthly follow-up by the neurologist, on the interest of correct follow-up of subsequent pregnancies.
- A PCR done on D21 after discharge from intensive care was negative and the patient was declared cured of the COVID-19 infection.
- Counseling given to the couple with emphasis on a monthly follow-up by the neurologist, on the emphasis on a thorough follow-up of subsequent pregnancies.

Discussion

We described the case of a pregnant patient who was simultaneously affected by severe meningoencephalitis and COVID-19 in the late stages pregnancy. Seizures, whether or not associated with impaired consciousness in a pregnant woman, first suggest eclampsia. Seizures and coma are common signs of eclampsia and meningoencephalitis, but cannot be aloofly ruled out as extra-respiratory manifestations of COVID-19. Tonicoclonic convulsive seizures with a postcritical phase are found in eclampsia. Eclampsia refers to the occurrence of a grand mal seizure in a woman with preeclampsia in the absence of other neurological conditions that may explain the seizure. Preeclampsia is the onset or worsening of high blood pressure, associated with excess protein in the urine, which develops after the 20th week of pregnancy. In 2013, the American College of Obstetricians and Gynaecologists ruled out proteinuria as an essential criterion for the diagnosis of preeclampsia (hypertension and signs of significant end organ dysfunction are sufficient for diagnosis). They also ruled out massive proteinuria (5g/24 hours) and fetal growth restriction (FCR) as possible features of severe disease, as massive proteinuria has a low correlation with the outcome, and FCR is managed the same way whether or not preeclampsia is diagnosed. The women most at risk are people of the black race, nulliparous and from disadvantaged socio-economic backgrounds [8]. The peak incidence is in adolescence and early 20s, but the incidence is also increased in women over 35 [8]. Eclampsia occurs in women with preeclampsia but sometimes presents before recognition of the underlying disorder. Most women have premonitory signs/symptoms in the hours before the initial attack. However, there could be no premonitory signs. In a systematic review [9] comprising 59 studies involving more than 21,000 women with eclampsia from 26 countries, the most common signs/symptoms or history and the percentage of women with them were: hypertension (75%); headache (66%); visual disturbances (27%); epigastric or right upper quadrant pain (25%), while 25% were asymptomatic. In our clinical case there was no proteinuria or arterial hypertension on admission and throughout hospitalization. The obstetric ultrasound and Doppler performed on admission did not show any sign of FCR or any sign of fetal distress. No known pathological history or notion of premonitory signs. These different elements made it possible to rule out the diagnosis of eclampsia. The SARS-CoV-2 infection, known as COVID-19, can lead to an inadequate immune reaction and coagulation responsible for a genuine viral sepsis. As a result, clinical presentations are polymorphic and varied from one patient to another. The clinical presentation of our patient is an illustration of this polymorphism which can confuse the practitioner. We noted damage to the central nervous system, peripheral nervous system, respiratory system, disturbance of biological parameters (CSF, D-dimer, PCT,). If one understands the Virchow triad describing the mechanisms of venous thrombosis, three factors can be involved: hypercoagulability, endothelial aggression and venous stasis. Hypercoagulability is underscored by the fact that one of the histo-

logical features of diffuse alveolar damage present in COVID-19 is fibrin deposition and mononuclear cell recruitment [10]. On the cerebral level, this hyper-coagulopathy would lead to cerebral thrombophlebitis which is evoked in our patient whose signs were of acute onset which presenting with headaches of varying types, comitial seizures, impaired consciousness, and motor deficits [13]. A Dutch monocentric study including 199 patients found a particularly high cumulative incidence of venous thrombosis on day 7 at 16% and on day14 at 42%. Helms., *et al.* found, despite the use of thromboprophylaxis, 64 events including 25 pulmonary embolisms and no coronary syndrome. This thrombosis could explain the multisystem involvement of our patient and the spectacular recovery in 7 days of the clinical presentation under effective anticoagulation and gives us comfort on the etiopathogenesis of our patient's clinical presentation [14,15].

Meningoencephalitis was retained in our patient on the basis of the clinical presentation, associated with anomalies of the CSF on the cytobacteriological and biochemical analysis of the CSF, moreover we did not demonstrate the presence of COVID19 in the CSF but nevertheless a study [16] revealed a case of meningitis associated with SARS-CoV-2, who was driven by ambulance for tonico-clonic seizures accompanied by altered consciousness, of which the clinical examination revealed a meningeal syndrome. A real-time RT-PCR of the nasopharyngeal swab looking for COVID-19 will be negative, but will be detected in the CSF. On the other hand, the search for anti-HSV1 and IgM antibodies for herpes Zoster was negative. A brain MRI will highlight a hyper signal at the level of the right lateral ventricle, at the level of the right medial temporal lobe of the hippocampus, suggesting the possibility of SARS-CoV-2 meningitis [16], in our patient we did not do an MRI but a brain CT which turned out to be normal.

Conclusion

COVID-19 continues to be a medical curiosity to this day, the outcome of which can be fatal despite considerable advances in the understanding of its pathophysiology and manifestations. It is not easy to recognize all the clinical forms in vulnerable areas such as that of pregnant women in whom we might tend to think only of the complications usually encountered. t would be important for practitioners to pay attention to the polymorphism that this disease could present in particular areas.

Conflicts of Interest

The authors declare no conflict of interest.

Contributions from Authors

All the authors contributed to the production of the manuscript. All the authors contributed to the conduct of this work. All authors also declare that they have read and approved the final version of the manuscript.

Annex

Local COVID-19 treatment protocol:

- Hydroxychloroquine or Chloroquine 200mg/8h for 10 days
- Zinc sulfate 20mg/24h for 10 days
- Vitamin C 1g/24h
- Azithromycin 500mg on D1, then 250mg from D2 to D5
- Amoxicillin-clavulanic acid 1g/8h for 7 days.

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Volume 4 Issue 9 September 2021