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Case Report

Role of Lung Ultrasound in Obstetric Decision Making in Times of Pandemic COVID19. Case Report

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Abstract

Introduction: The rapid emergence and spread of the novel SARS-Cov-2 virus is a global health concern. Researchers have studied the increase in cases in obstetric patients from associated perinatal morbidity. The results, although still controversial due to the scarcity of the series described, urge us to recommend closer surveillance in this population group. Emergency care teams together with Obstetricians are encouraged to seek alternative diagnostic tools.

Case Report: We present the case of a full-term pregnant woman who consults in our emergency department with symptoms compatible with COVID-19 infection and due to her clinical situation, needs to make quick decisions about maternal-fetal management.

Conclusion: In many cases, confirmatory laboratory tests are not always accessible or fast enough when making decisions in obstetrics, so lung ultrasound has emerged as a possible response to this demand from clinicians, since it is an accessible and quick method to perform at the patient's bedside.

Keywords: *COVID19; Lung Ultrasound; Pandemic; Pregnancy; SARS-Cov-2*

Introduction

We present a case report of a full-term pregnant woman with respiratory symptoms in which the disease caused by SARS-CoV-2 is confirmed. The clinical and obstetric situation of the patient required urgent delivery of the pregnancy. The article serves as a review of the disease management model in the pregnant population subgroup. As a novel element and according to the current scientific trend of searching for improvement alternatives in the approach of this new pandemic, we propose and discuss the benefits of lung ultrasound as a support tool in the evaluation of the patient.

Case Presentation

On March 19, 2020, a 35-year-old woman, in her 40th week of pregnancy presented to our hospital emergencies department with symptoms suspected of infection, during the SARS-CoV 2 alarm state. She refers dysthermia, poor general condition, seven days evolution cough, and progressive worsening dyspnea.

The patient was primigravid with follow-up in the high-risk obstetric unit due to a chronic heart disease history. She presents a not requiring treatment 2nd grade pulmonary valve regurgitation.

She was placed in an isolation box and several studies performed:

- Oxygen saturation: 86.5%.
- Blood test: hemogram, biochemistry, ions, liver profile, coagulation times: no pathological findings
    - Others: C reactive Protein 2.95 mg/dl, Ferritin 81 ng/ml, Cardiac troponin T 6 ng/L, Procalcitonin 0.05 ng/ml, Dimer DD 526 ng/ml; Venous Blood Gas: Ph 7.37.
- Imaging findings:
    - X-ray on admission: triangular morphology and alveolar infiltrate in the right lower lobe peripherally.
    - Lung ultrasound: B basal and isolated lines in left base, pleural slip present/lines B confluent sign "White Lung" in all right hemithorax, subpleural consolidation base, sliding pleural present.

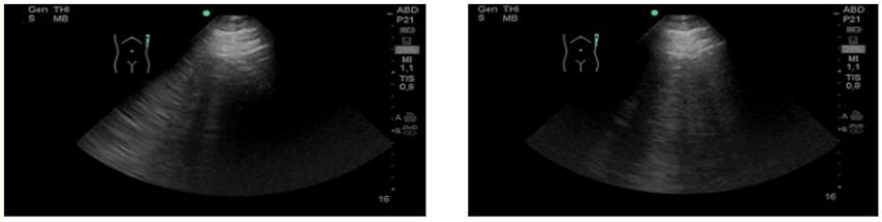

Figure 1: *Transthoracic Lung Ultrasound Scan non coalescent B-lines, moderate loss of aeration. LUSS 1 (degree of loss of aeration).*

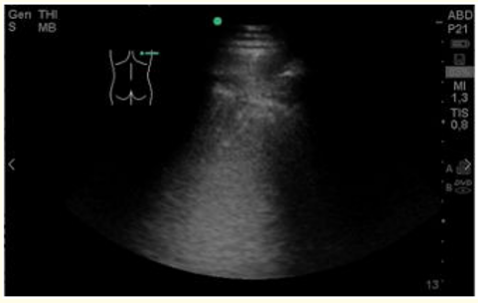

Figure 2: *Transthoracic lung ultrasound obtained at the posterior right basal region demonstrating coalescing B-lines and an irregular pleural line with areas of peripheral consolidation (sub-pleural consolidation).*

- Microbiology smears
    - Influenza virus A, B and RSV - PCR nasopharyngeal: negative.
    - Pneumococcus and Legionella Pneumophila - Orine Antigen: negatives.
    - SARS-CoV-2 -PCR nasopharyngeal: Positive (48h delayed result).

An urgent C-section was performed, due to the clinical instability of the patient with oxygen desaturation, in a suspected but not confirmed COVID19 infection context, with the goal of improve lung expansion volume and allow optimal and unrestricted pharmacological management. WHO-established protection measures were respected and giving to birth an asymptomatic 3.1 kg male child with test results: Apgar 9/10, arterial pH 7.25 and venous pH 7.35, was admitted to the neonatal ICU for surveillance.

Chest CT (postpartum): Confluent foci of ground glass infiltrate in both lung bases, slight associated crosslinking and prominent distal vessels of predominantly peripheral and subpleural distribution. Pseudonodular consolidation foci (LSD and LID), air bronchogram.

Compatible with COVID-19 lung involvement.

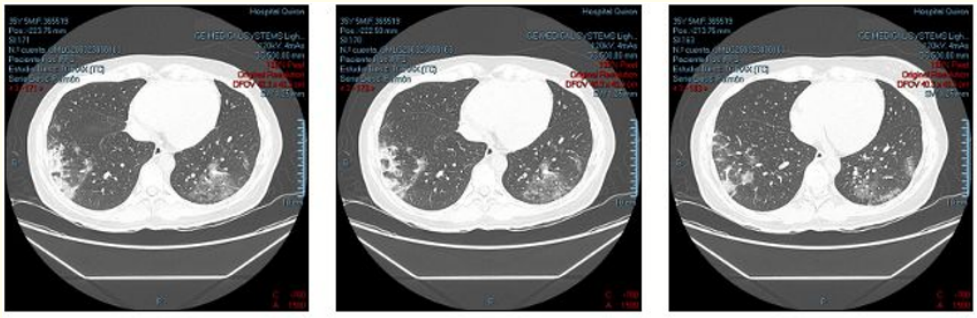

Figure 3: *CT images demonstrating pneumonia consistent with COVID19 infection.*

Treatment during puerperium admission:

- Measured isolated single room.
- Intravenous antibiotic: Cefazolin, Ceftriaxone, Azithromycin.
- Analgesics and antipyretics: Dexketoprofen, Paracetamol.
- Antiemetic: Pantoprazole, Metoclopramide.
- Anticoagulant: Bemiparin.
- Hydroxychloroquine.
- Antivirals: Lopinavir/Ritonavir.

Image control Radiography and CT:

- 4th day: Confluent foci of ground glass infiltrate (both lung bases) confirmed bilateral interstitial pneumonia due to SARS COV-2.
- 10th day: Improving respiratory process reported.

The subsequent evolution was satisfactory and both mother and child could be discharged in a short period of time and without having been shown vertical transmission or involvement in the neonate. The neonate was discharged earlier by an asymptomatic and proven negative test relative. Covid19-PCR nasopharyngeal swab was negative in both birth and 7th day samples taken. The mother after 11 days, with outpatient treatment and non-contact control via videoconference with a total resolution of the symptoms and negative PCR COVID-19 achieved on day 16.

All the procedures performed were in accordance with the clinical guidelines and protocols established by the COVID19 health emergency.

Discussion and Conclusion

We report a usual clinical evolution of pulmonary infection due to COVID19. All the recommended tests were applied. As a novel element in the management, strength in our article, we support the initial diagnostic suspicion with the performance of lung ultrasound. Subsequent Chest-CT and PCR confirmed the suspected diagnosis, revealing complete agreement of pathological images.

The 30th January 2020, WHO declared the coronavirus "2019-nCoV" outbreak a public health emergency of international concern [1]. The pandemic caused has surprised affected countries devoid, in real time, of the adequate means for early manage of its consequences. The extremely high contagiosity [2] of this virus involve us in a figurative competition between, on the one hand, the learning of its pathophysiology, risk and protective factors, screening tools, diagnostic tests, therapies and vaccine research and, on the other hand confirmed cases and deaths. (WHO update for Europe Region respectably 914,366/77,438) [1].

As obstetricians, we are concerned about a particularly vulnerable population: pregnant women [3,4]. Their peculiar immunological situation, limited lung capacity and the increased need of intensive care or mechanical ventilation and perinatal morbidity and mortality described with others similar pathogens preceding [5], demonstrate that the concerned of a possible intrauterine vertical transmission is not the only epidemiological criteria to monitor in this agent. Clinicians and researchers must quickly record and share [6], all the data available in cases of emerging infectious diseases, in order to obtain a more accurate and rigorous view of the situation.

In clinical practice, we have a limited access to diagnostic test and it is necessary to prioritize the subjects to use them. Thus, we don't have the actual prevalence of positive COVID19 cases, neither in the general population nor in the subgroup of pregnant. Asymptomatic cases or those with mild symptoms are underdiagnosed. In this paradigm, the assess to other alternative screening tools is urgent, taking advantage of the human and technological resources that we already have but seeking the benefits of an early diagnosis.

Chest radiography has shown to lack adequate sensitivity for diagnosis lung involvement in COVID19. CT, the most sensitive test, is not always available, and implies the transfer of the patient to the Department of Radiology. In contrast, lung ultrasound, emerges as a sensitive, accessible, repeatable tool that does not expose the patient to ionizing radiation. It is carried out with a portable equipment

at the bedside of the patient with personal and ultrasound protective equipment (droplet and contact protection). The changes in lung ultrasound are described in COVID-19 patients [7] and we can integrate it in our Emergency Department allowing the patient to be assigned to the most convenient care area [8].

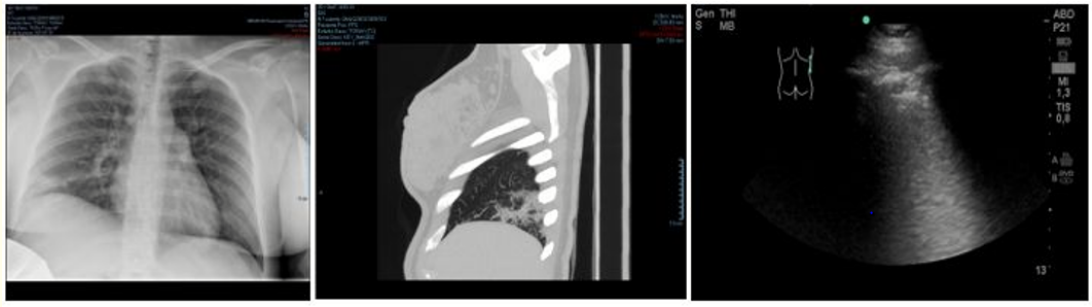

Figure 4: *Comparison of chest radiography, chest CT and lung ultrasound that shows lung consolidation in right basal on paravertebral line, complete loss of aeration. LUSS 3.*

Its application in pregnant women and the systematic procedures are conveniently described in the recent article in 'Ultrasound in Obstetrics and Gynecologist' [9] and encourage Obstetricians to be trained to differentiate a normal image from pathological. Kalafat., *et al*. [10] described its usefulness in the face of a falsely negative COVID19-PCR. In our case it helped in the orientation of the diagnosis and in the most favorable resolution for our binomial to protect mother-child.

Acknowledgements

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Declarations

The authors report having no conflict of interest with the published data.

All the procedures performed have followed the established protocol for the management of patients with COVID19 infection.

For the publication of the case report as well as the use of the data derived from the pregnancy, childbirth and neonate, oral and written consent has been acquired by the patient presented.

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