A case of COVID-19 in a pregnancy complicated by fetal pleural effusion

Łukasz Witek[1], Natalia Filochowska[1], Tomasz Janikowski[2], Helena Sławska[1], and Anita Olejek[1]

[1]Medical University of Silesia
[2]Silesian College of Medicine in Katowice

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Łukasz Witek[1], Natalia Filochowska[1], Tomasz Janikowski[2], Helena Sławska[3], Anita Olejek[1]

[1]Department of Gynecology, Obstetrics and Oncological Gynecology, Medical University of Silesia, Bytom, Poland

[2]Silesian College of Medicine, Katowice, Poland

[3]Department of Neonatology in Bytom, Medical University of Silesia, Katowice, Poland.

INTRODUCTION

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is the virus that mainly affects the respiratory system, leading to severe respiratory failure and even death (1). Today's knowledge on the effects of the virus on pregnancy is still poorly understood (1-3). There is evidence that SARS-CoV-2 can cross the placenta (2-4). Viral RNA and proteins are detected in placental swabs or biopsies and in the amniotic fluid (2-6). However, it is not known how long the virus persists in the placenta after the mother's infection (2). Although the risk of SARS-CoV-2 transmission from mother to fetus is low (7), pregnancy complications (2,5,6) are potentially serious.

In the following study we have reported a case of pregnancy complicated with an exudate in the fetal pleural cavity after the mother was confirmed to have SARS-CoV-2 infection in the third trimester.

REPORT CASE

A 29-years-old woman, 37 weeks of third gravida, two living children, has been referred to the Department of Gynecology, Obstetrics and Oncological Gynecology in Bytom due to diagnosed fetal effusion in right pleural cavity. The pregnancy was complicated by insulin-requiring gestational diabetes and cervical insufficiency requiring assumption suture. Due to Rh-negative blood type anti-D immunoglobulin was administered at the 28th week of pregnancy. At the gestational age of 34 weeks the woman developed a fever (38.0@C) and general weakness. Naso-oropharyngeal swab testing for SARS-CoV-2 (RT-PCR) was positive.

As a standard on admission, COVID-19 rapid antigen test was performed and was positive. A negative RT-PCR test result excluded an active infection. The ultrasound showed fluid in the right pleural cavity in fetus with the dimensions of 7.6 x 4.9 cm (Figure 1). Common laboratory tests showed no significant deviations from the norm. Similarly, C-reactive protein (CRP) and procalcitonin (PCT) levels were within the normal range. The patient was negative for antibodies of TORCH (toxoplasmosis, cytomegalovirus, parvovirus B19, herpes, syphilis, rubella and HIV). The fetal condition was systematically monitored by

cardiotocography and ultrasound. The patient was asymptomatic throughout most of this period. At 38+2 weeks of pregnancy a spontaneous vaginal delivery has occurred and a full-term male newborn was born with a birthweight 3650g and 6/7/8/9 points Apgar score. The rapid antigen test for SARS-CoV-2 performed on a newborn was negative. Due to single, shallow breaths nCPAP breathing support with FiO2 0,40-0,45 was administered. The ultrasound showed a collapse of the right lung compressed by fluid in the pleural cavity, heterogeneous echogenicity, with dominant B-line artifacts. The maximum fluid thickness was 1.7cm at the base of the lung. A thymus with a heterogeneous structure was also revealed. The laboratory tests showed negative parameters of inflammation. The right pleural cavity was drained and 150 ml of the yellow, cloudy liquid fluid was evacuated. Thereby improvement in respiratory efficiency was achieved. The microbiological examination indicated a fluid of a lymphatic nature. The computed tomography (CT) scan of the chest excluded pathological changes in the mediastinum. Serological tests ruled out congenital TORCH infection. Diagnostics was extended to group B Coxackie virus infection, which was negative. The karyotyping ruled out genetic disorders. On day 7, a continuous infusion of octreotide was ordered and reduction in lymphorrhea was observed, until it resolved. RT-PCR tests for COVID-19 were performed twice at 16th and 19th days of life with negative results. After 19 days of hospitalization and total evacuation of approximately 850 ml of lymph, the newborn was discharged in good general condition.

DISCUSION

Secondary pleural effusion is usually caused by generalized fluid retention in non-immune hydrops (8). The causes of this pathology include cardiovascular and idiopathic diseases, genetic, metabolic and hematological disorders, infections, structural abnormalities and chest tumors (9). To the best of our knowledge there where only reported three confirmed SARS-CoV-2 infections during pregnancy complicated by hydrops fetalis (2-4). In each case, the SARS-CoV-2 infection occurred in a different trimester of pregnancy and all of them were complicated by intrauterine fetal death. Two patients were infected before diagnosis (2,4) and one was in active infection (3). Whereas, a PCR SARS-CoV-2 test was performed on a fetal lung biopsy and was positive (3). An active infection from the TORCH group was ruled out in these patients. Cytogenetic analysis revealed a normal karyotype in every case. Moreover, histologic examination of the placenta or fetal tissues was performed. Shende et al. reported fibrin deposition around the villi, where the syncytiotrophoblast was lysed, and extensive leukocyte infiltration suggesting inflammation (2). A similar picture was obtained in the studies by Rodrigues et al. and Popescu et al. In both cases a postmortem examination showed systemic thrombosis with thrombi in the small and medium vessels. Recent blood clots were identified in fetal circulation (3,4). In the study by Popescu et al. the pregnant was Rh negative so, Rh immune globulin was given, as in our case. An attempt was made to perform a thoracocentesis and insert a percutaneous in utero thoracoamniotic shunt (4). The limitations of our case are no SARS-CoV-2 tests performed in placenta, amniotic fluid, and fetal tissues. After birth the rapid antigen test was performed, which was negative. Therefore only the clinical symptoms and the exclusion of other possibilities, i.e. TORCH infections, genetic disorders, Rh immunization and the proliferative process may indicate vertical transmission of the virus. This case may constitute the basis for further studies, as the pleural effusion is a serious emergency for a newborn.

CONCLUSION

The presented case of a fetal pleural effusion shows differences in procedures and circumstances, when dealing with SARS-CoV-2 in pregnancy. Furthemore, the study may suggest a possible transmission of the virus through the placenta and may indicate risks associated with it. More research is needed to shed more light on the vertical transmission of SARS-CoV-2 so that universal screening of all pregnant women can be performed to avoid the adverse effects of the infection. The addition of vaccination against COVID-19 to the recommended immunizations for women trying to become pregnant should also be considered.

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Declarations

Patient consent for use of medical data and history for article preparation and publishing was obtained after finishing treatment.

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