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COVID-19 in Pregnancy: A Single-center Experience in Kazakhstan

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ABSTRACT

Pregnancy is one of the important vulnerable groups in COVID-19. The clinical course may be asymptomatic, mild, severe or very severe. The patient may have experienced a prolonged course and might be resulted in death. This study was performed retrospectively in Semey Infectious Diseases Hospital (East Kazakhstan) from April to November 2020. Medical reports of cases with COVID-19 were collected and reviewed. The results were analyzed according to clinical presentation and outcome. In this study, twenty cases of COVID-19 in pregnant women were described. All cases were recovered, but one case died. The clinical symptoms of COVID-19 in pregnant and non-pregnant patients were similar. However, some pregnant women might develop more severe infections, so extra precautions need to be taken. Pregnancy increases the risk of hospitalization, needs treatment in intensive care conditions and mechanical ventilation.

Keywords: COVID-19, clinical case, outcome, pregnancy, fatal case

INTRODUCTION

The clinical symptoms of COVID-19 in pregnant women and non-pregnant adults are similar (1). Fever and cough are the most common symptoms in pregnant women, but pregnant women less frequently than non-pregnant women report fever and myalgia (2). Pregnant women have similar rates of clinical courses and outcomes for COVID-19 as non-pregnant women in reproductive age (3). Doctors need to remember that symptoms as fever, dyspnea, gastrointestinal symptoms, and fatigue may develop in pregnant women due to physiological changes or adverse course of pregnancy (4). The majority of pregnant patients have an asymptomatic or mild course of COVID-19 and recover without undergoing delivery (5), but some number of patients develop a critical course of the disease and may have prolonged and complex course (6). Pregnant women may have a high risk of severe disease and negative consequences of pregnancy (7). The risk of death in pregnancy does not differ from non-pregnant, reproductive-aged women (8). Maternal deaths may also develop due to cardiopulmonary complications and multiorgan failure (9). Often maternal deaths from cardiopulmonary complications and multiorgan failure have been reported in women with no accompanying diseases (10). The present study aims to present the clinical outcome of the cases with COVID-19 with pregnant in Semey Infectious Diseases Hospital and to present a fatal clinic form of COVID-19.

MATERIALS and METHODS

This study was performed retrospectively in Semey Infectious Diseases Hospital (East Kazakhstan) from April to November 2020. Medical reports of cases with COVID-19 were collected and reviewed. The clinical details and outcome of the pregnant cases were recorded. The severity of infection, clinical course and complications were also recorded. The diagnosis of cases was based on the history of the disease, clinical findings and positive PCR for SARS-CoV-2. This study included the pregnant cases with COVID-19 confirmed with PCR for SARS-CoV-2. This study was approved by the Ethics Committee of Semey Medical University (Date 12.02.2021 and Issue number 6.1). Statistics analysis was carried out manually. The results were given number and percentage.

RESULTS

COVID-19 Cases in Semey Infectious Diseases Hospital

During the study period, 1043 patients with COVID-19 were hospitalized in Semey Infectious Diseases Hospital. Of these, 20 (1.9%) patients were pregnant. The age of pregnant patients varied from 18 to 40 years. Three patients (15%) were between 18–24 year-old, six (30%) between 25–29 year-old, 7 (35%) between 30–34 year-old and four (20%) between 35–40 year-old. The clinical severity was moderate in 18 (90%) patients and severe in two (10%) patients. Pregnancy period was as follow in the cases; two (10%) in the 1st trimester, six (30%) in the 2nd

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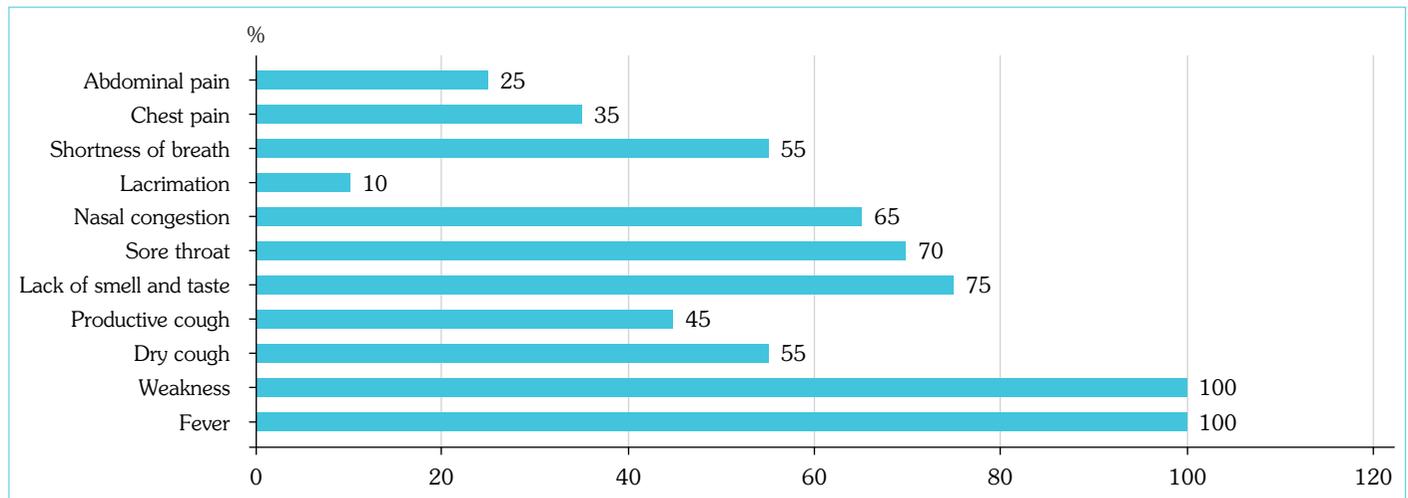


Figure 1. Clinical symptoms COVID-19 in pregnant women hospitalized in Semey Infectious hospital

trimester and 12 (60%) in the 3rd trimester. Clinical presentation of COVID-19 in pregnant patients was characterized as follows: sub-febrile fever (less than 38°C) was observed in 14 (70%) patients and fever (over 38°C) in six (30%) patients. Weakness developed in all diseased pregnant women (100%). Respiratory symptoms and findings were dry cough in 11 (55%) patients, productive cough in nine (45%), loss of smell and taste in 15 (75%), sore throat in 14 (70%), nasal congestion in 13 (65%), lacrimation in two (10%), shortness of breath in 11 (55%) and chest pain in seven (35%). Acute tonsillitis was observed in one case. Abdominal pain was developed in five (25%) pregnant women. Respiratory failure was recorded in five patients (25%). Concomitant disease with anemia was present in five patients. Nineteen cases were recovered and one case (5%) was resulted in death due to COVID-19 (Fig. 1).

Clinical Presentation of the Fatal Case

A 21-year-old pregnant woman, at the age of 37–38 weeks' gestation, complained of sore throat, running nose, cough with mucopurulent sputum, fever up to 37.4°C, weakness and myalgia. She was admitted to COVID-19 hospital on the 7th day of disease with a tentative diagnosis of COVID-19. The clinical diagnosis was confirmed with a positive PCR test for SARS CoV-2. The duration of pregnancy was 37 weeks and three days. She had mild anemia and her condition was moderate. Her temperature was 37.4°C, throat was hyperemic, nasal breathing is difficult, serous discharge, breath rate (BR) – 20/min, saturation - 99%. Pulse rate (PR) was 90/min and blood pressure (BP) 110/70 mm Hg. The abdomen enlarged due to pregnancy at the age of 37 weeks. Laboratory examination revealed mild anemia, accelerated ESR, neutrophilic shift to the left and a decrease of protein in biochemical analysis of blood (Table 1). Treatment was initiated with a combination of ceftriaxone and cefuroxime with intravenous fluid infusions and an anticoagulant (Clexane). X-ray of the chest showed both sides pneumonia. On the first day of hospitalization, the clinical situation of the case was worsened in view of respiratory failure (BR was 26/min, oxygen saturation 95% and PR 102/min). Therefore, an emergency operative delivery was performed. CT revealed signs characteristic for both sided pneumonia due to COVID-19 with a lung lesion in 76% of the total lung volume. In the next days, the patient's condition was progressively worsened: the oxygen saturation less than 80%, BR - 34/min, PR - 120/min, BP - 80/50

mmHg. Initially non-mechanical ventilation, later then mechanical ventilation was connected. Despite all emergency measures, the patient was resulted in death on the 6th day of hospitalization.

An autopsy was performed on the death body. Bilateral multi-segmental, the total on the right, subtotal on the left, viral pneumonia and pulmonary artery thrombosis were observed. Toxic degeneration was observed in the other internal organs. The postpartum period was 6th days. Histopathological examination of the lungs showed that structural disorganization of the lung parenchyma with a change in normal architecture due to rapidly progressive fibrosis. In the studied pieces of the lung, there were mainly areas of atelectasis and distelectasis with single slit-like gaps. In the lumen of the alveoli, erythrocytes, fibrin with signs of organization, desquamated alveolocyttes, leukocytes, here and there with the formation of micro-abscesses. Inter-alveolar septa sharply thickened due to the proliferation of fibroblasts and myofibroblasts, diffuse infiltration by macrophages, polymorphonuclear leukocytes and a few lymphocytes. The epithelial lining of deformed inter-alveolar septa represented by proliferating alveolocyttes type 2, with signs of pronounced reactive and dysregenerative changes. The epithelium of the bronchi desquamated. In places necrotic, there were proliferative, hyperplastic and metaplastic changes, foci of squamous cell metaplasia. In the lumen of the bronchi, here and there were with fibrin with leukocytes. In the lumen of the vessels, there were fibrin and mixed-blood clots (Fig. 2). The patients' consent was obtained for this study.

DISCUSSION

Pregnancy is one of the important vulnerable group in COVID-19. Infected cases (65%) were recorded mostly in the third trimester (3). The majority (88%) of women who tested positive for SARS-CoV-2 at admission were asymptomatic (11). The clinical picture of COVID-19 in pregnant women is manifested with fever and cough (>65%), less often dyspnea, sore throat and myalgia (<10%) (12). Pregnant patients with COVID-19 and non-pregnant women had the symptoms respectively, cough with a frequency between 52–54%, shortness of breath 30%, headache 41–52%, myalgia 38–47%, fever 34–42%, chills 29–36%, diarrhea 14–23%. Less common symptoms were sore throat, rhinorrhea, nausea, vomiting, loss of smell and/or taste (13). The clinical course of these forms

Table 1. A summary of the laboratory test results of the case according to hospital days

Laboratory test	Hospital days				
	1 st day	2 nd day	3 rd day	6 th day	7 th day
WBC (x10 ⁹ /l)	8.9	10.6	10	10	8.9
Lymphocytes %	16	12	8	3	10
Haemoglobin (g/l)	98	97	100	85	92
RBC (10 ¹² /l)	2.85	3.0	3.48	2.79	3.09
CI	1.0	0.97	0.86	0.91	0.89
Trombocytes (x10 ⁹ /l)	200	180	220		
ESR (mm/h)	35	36	40	44	55
ALT (Ed/l)	8.48	0.35	8.48	26.03	32.14
AST (Ed/l)	8.5	0.47	21.5	59.56	59.21
Tbil (mcmol/l)	9.13	12.5		17.28	19.14
Creatinine (mcmol/l)	44.6	90	44.6	60.09	66,230
Urea (mcmol/l)	4,3	4	4,3	5.33	6.51
INR	1.23	1.23	1.1	1	
APTT (sec)	37	35	38	33	
Fibrinogen (g/l)	2.886	2.442		3.552	

WBC: White blood cells; RBC: Red blood cells; CI: Confidence interval; ESR: Erythrocyte sedimentation rate; ALT: Alanine aminotransferase test; AST: Aspartataminotransferase test; Tbil: Total bilirubin; INR: International normalized relation; APTT: Activated partial thromboplastin time

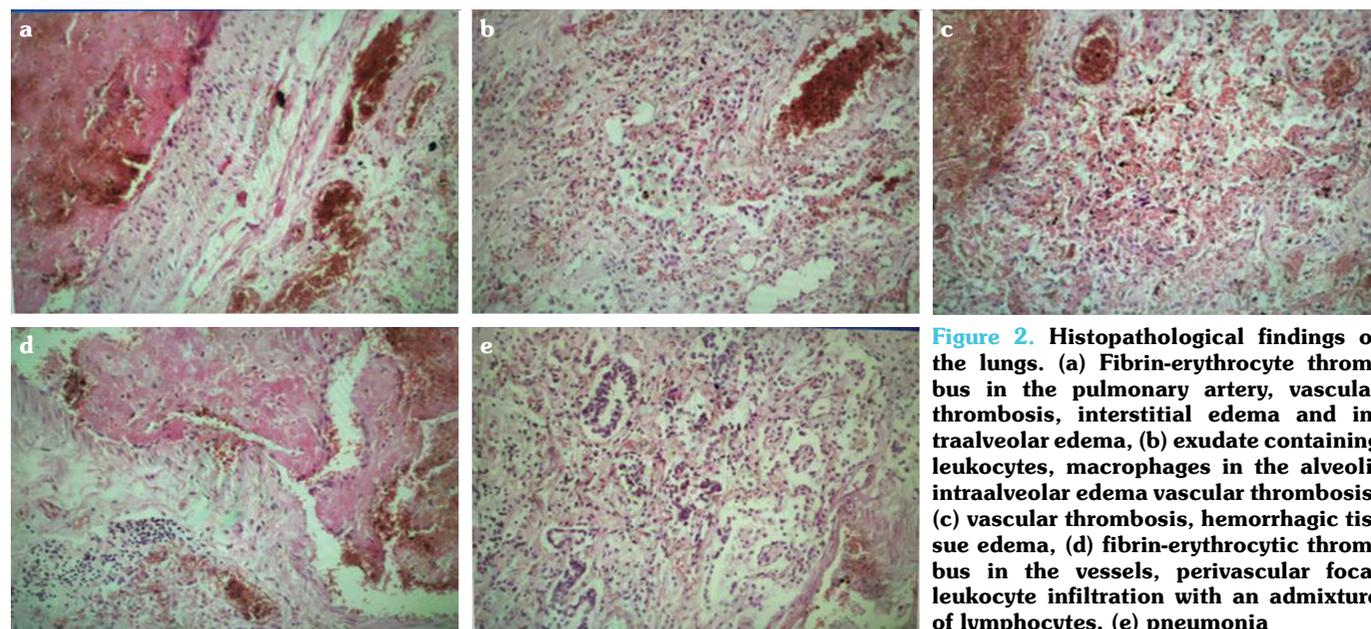


Figure 2. Histopathological findings of the lungs. (a) Fibrin-erythrocyte thrombus in the pulmonary artery, vascular thrombosis, interstitial edema and intraalveolar edema, (b) exudate containing leukocytes, macrophages in the alveoli, intraalveolar edema vascular thrombosis, (c) vascular thrombosis, hemorrhagic tissue edema, (d) fibrin-erythrocytic thrombus in the vessels, perivascular focal leukocyte infiltration with an admixture of lymphocytes, (e) pneumonia

in hospitalized pregnant patients can be shorter than in non-pregnant patients (14). Severe clinical forms of pregnant women begin from respiratory failure progressing to acute respiratory distress syndrome, multiorgan disorders as renal failure, thromboembolic disease, cardiovascular and inflammatory complications, secondary infections, and neurologic sequelae (15). In this study, the severity of infection was moderate in the majority of cases. The most common symptoms observed in pregnant cases were fever, weakness, upper and lower respiratory symptoms (such as sore throat, nasal congestion, loss of smell and taste and shortness of breath).

Maternal deaths from critical conditions are recorded as 1.6% in the clinical studies (9). It is also noted that 3% of pregnant women need hospitalization in an intensive care unit. The neonatal mortality is reported at the rate of 0.3% in the neonates delivered from the pregnant women of COVID-19 (6). The physicians may aware about COVID-19 during the pandemic period. A severe clinical outcome may be seen in pregnant women, so extra precautions need to be taken. Pregnancy increases the risk of hospitalization, needs treatment in intensive care conditions and mechanical ventilation.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – SM; Design – DS; Materials – DS; Analysis and/or Interpretation – SM, DS; Literature Search – SK; Writing – SK; Critical Reviews – SM.

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