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COVID-19 infection and pregnancy: Complications and outcomes of gestation in the city of Osh and Osh region, Kyrgyz Republic

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Abstract

The global health emergencies brought on by the SARS-CoV-2 virus, which causes COVID-19, primarily affect pregnant women. The association between COVID-19 infection and birth outcomes and pregnancy-related complications is still being studied by the medical community. Our study investigates these knowledge gaps by examining in detail how the virus affects pregnancy in a particular patient population in Osh region of Kyrgyzstan. The research aimed to determine major obstetric complications and assess the risk of adverse pregnancy results from the infection. We performed a retrospective analysis on 265 pregnant women with confirmed COVID-19 who were hospitalized at maternity facilities in Osh. The study was conducted at the maternity departments of Osh Regional Clinical Hospital and Osh Municipal Clinical Hospital. Anamnestic details, clinical course, laboratory parameters (particularly coagulogram changes), pregnancy outcomes, and delivery methods were among the data collected. Our study revealed no elevated risk of severe COVID-19 in pregnant women relative to the general population. However, we identified a heightened incidence of obstetric complications, including premature birth, hypertensive disorders, and gestational pyelonephritis. While vertical transmission was not confirmed in our cohort, pregnancy outcomes showed a minor increase in premature birth rates and, in rare instances, perinatal mortality, particularly in cases of severe maternal illness. The research indicates that SARS-CoV-2 infection during pregnancy does not lead to automatic severe illness but it does elevate the chances of specific pregnancy complications. The study supports the recommendation for COVID-19 vaccination in pregnant women to prevent severe disease and negative outcomes. More research is needed to find out how SARS-CoV-2 infection affects the health of mothers and their child.

Keywords: COVID-19, Pregnancy complications, Obstetric outcomes, SARS-CoV-2 infection, Kyrgyzstan.

1. Introduction

The worldwide healthcare system disruption from COVID-19 revealed multiple vulnerabilities which affect different population groups and geographical areas. Pregnant women represent one of the most vulnerable population groups. The disease progression and treatment response of pregnant women is influenced by their body changes and immune system modifications during pregnancy. The COVID-19 pandemic has created additional challenges for maternal and perinatal health throughout Kyrgyzstan particularly in the city of Osh and its surrounding Osh region [1]. The second-largest city in the nation has dense population which creates a special environment for public health that influences disease transmission and reproductive health consequences. The medical importance of understanding COVID-19 manifestations in pregnant women in Osh becomes essential for developing specific interventions to reduce complications and improve maternal-fetal results. The research investigates the occurrence and types of pregnancy complications caused by COVID-19 while assessing its impact on fetal and newborn health and determining factors that increase the risk of adverse outcomes for pregnant women [2].

While the global scientific community has made significant progress in documenting the maternal and

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perinatal effects of COVID-19, most existing research has been concentrated in countries with robust healthcare infrastructures and well-established data collection systems [3]. Comparative analyses have revealed that although certain complications such as preterm birth, preeclampsia, and increased caesarean section rates appear consistently across diverse settings, the severity and nature of disease progression often vary according to population health status, comorbidities, and healthcare capacity [4,29]. Research conducted in Russia and India showed that pregnant women mostly experienced mild to moderate illness but these studies also demonstrated that pregnant women with diabetes or obesity faced higher risks of severe disease. The medical reports from the United States and Kazakhstan showed that a substantial number of pregnant patients needed intensive care [5]. The research on Central Asia remains underdeveloped because there is insufficient scientific investigation of Kyrgyzstan's specific healthcare environment. The lack of local data prevents the creation of evidence-based interventions that match the actual conditions in Osh and its surrounding areas which makes this research both urgent and essential. The COVID-19 pandemic produced different effects on pregnancies throughout various countries according to Table 1, as the number of cases ranged from several hundred to almost 200,000 and the severity depended on existing medical conditions and healthcare availability and when the infection occurred [6]. The pregnancy complications included premature birth and preeclampsia and fetal hypoxia and increased cesarean sections while maternal and perinatal mortality rates showed regional variations. The healthcare system in Kyrgyzstan faced significant challenges during pandemic surges although the available data remained scarce [7].

The research provides essential knowledge about COVID-19 effects on pregnant women in Osh and the Osh region. The research establishes global connections to established regional trends while revealing unique characteristics that result from regional population demographics and healthcare access and disease management practices. The research provides value through its connection between worldwide patterns and local conditions which produces better understanding of COVID-19 impacts on maternal and perinatal health in a low- to middle-income country with dense population [8]. The research findings will directly benefit medical professionals and public health experts and policymakers in Kyrgyzstan to develop prevention and monitoring and treatment plans that address the specific needs of pregnant women in the region. The research contributes to worldwide maternal health pandemic studies through its localized data collection from an understudied geographic area which enhances the completeness of international maternal health research [9].

Table 1. The impact of COVID-19 on pregnant women - A global overview

Country	**Incidence/Prevalence**	**Clinical Course & Severity**	**Key Complications**	**Pregnancy & Perinatal Outcomes**
Russia	~10% of pregnant hospitalizations in large cities.	Mostly mild or moderate. Greater risk of severe progression in the presence of comorbidities (obesity, diabetes).	Premature birth (15-20%), preeclampsia, fetal hypoxia, increased cesarean sections.	Most outcomes were satisfactory; perinatal mortality was reported.
Kazakhstan	>10,000 cases reported.	10-12% of cases required ICU hospitalization (2020-2021).	Thromboembolic complications, placental insufficiency, fetal growth retardation.	Premature birth in 18% of severe cases; perinatal mortality at 1.1%.
India	High incidence, especially during peak waves.	Mostly mild. Severe cases more common with anemia, obesity, and diabetes.	Premature birth (~15%), fetal hypoxia, maternal hypoxemia. Increased risk of stillbirth.	Severe cases more frequent in rural areas due to limited healthcare access.

England	10-15% of pregnant women infected.	4% required intensive care, more often in the third trimester.	Preeclampsia. Cesarean section in 50% of severe cases.	Mostly successful pregnancies. Higher risk for obese women over 35.
USA	~194,000 reported cases (by 2022).	Severe in 9% of cases, with risk of ICU admission.	Premature birth (16%). High percentage of cesarean sections.	Maternal mortality rate of ~1.4 per 1,000 pregnant women.
Germany	~17,000 cases reported (2020-2023).	Serious complications like hypoxia required ICU and mechanical ventilation in some women.	Increased risk of premature birth, low fetal weight, and cesarean sections.	N/A
Switzerland	Several hundred cases reported.	Severe cases led to higher ICU admission rates.	Complications with fetal development in severe cases.	More frequent premature births and an increase in cesarean sections in severe cases.
Kyrgyzstan	Limited national data; exact figures not highlighted.	Healthcare system overloaded during peak of the pandemic.	N/A	Difficult access to quality care for pregnant women.

2. Maternal and neonatal impact of COVID-19 in Osh region

2.1 Pregnancy course and complications

Research indicates that COVID-19 infections during pregnancy can lead to preterm birth complications and potential damage to the fetus. The pandemic created systemic healthcare delivery problems which worsened these risks in Kyrgyzstan particularly in Osh and the Osh region [10]. Lockdowns, limited transportation, and the overburdened healthcare system caused many pregnant women, particularly those in isolated or mountainous regions, to experience delays or total lack of access to timely medical care. According to Ch. A. Stakeeva, the pandemic period saw a rise in maternal mortality linked to COVID-19 complications, with insufficient access to essential obstetric services during quarantine being a major contributing factor. This underscores how the interplay between infection-related risks and healthcare accessibility gaps magnified adverse pregnancy outcomes, highlighting the urgent need for context-specific maternal care strategies during health crises [11,28].

2.2 Pregnancy outcomes

The current data collection on maternal mortality and COVID-19 complications in Kyrgyzstan remains insufficient at the national level. Medical facilities and staff received specialized training and better equipment for obstetric and perinatal care according to institutional and anecdotal reports. The healthcare system faced its greatest ever pressure during the pandemic even though these interventions were implemented which likely affected the quality of care delivered [12]. The limited healthcare access faced by women in rural and economically disadvantaged areas raised their chances of developing preterm birth and gestational hypertension and stunted foetal growth complications. The worldwide patterns of negative effects align with Kyrgyzstan's unique socioeconomic and geographic challenges which require tailored solutions. The healthcare system needs to understand these local outcomes to improve its emergency response capabilities and future public health emergency readiness [13].

2.3 Complications in newborns

The information that is currently available indicates that SARS-CoV-2 rarely spreads vertically from mother to child, and most of the time, newborns born to infected mothers showed little to no symptoms. The health of newborns shows noticeable indirect effects from maternal COVID-19 infection despite these effects being limited [14,30]. The various factors including low birth weight and prematurity and precautionary monitoring because of maternal

illness led to hospital admissions for about 25% of newborns from infected mothers. The research aligns with international studies but the Kyrgyz situation introduces additional factors which include limited resources in neonatal units and different clinical approaches and transportation challenges for sick newborns located in distant areas [15]. The best outcomes for pandemic-born infants require improved neonatal care infrastructure together with standardized management guidelines in areas with challenging healthcare access and geographic limitations.

3. Methodology

3.1 Study design

This research was conducted as a prospective cohort study to assess the complications and outcomes of pregnancy in women with and without confirmed COVID-19 infection. The researchers tracked participants starting from their COVID-19 diagnosis confirmation or control group verification until delivery. The research design enabled researchers to track clinical development and pregnancy issues and birth results among a particular population. The research design enabled strong comparison between virus-exposed participants and unexposed participants. The research design was selected because it effectively identified relationships between COVID-19 exposure and maternal and infant health results.

3.1. Study period and setting

The study was conducted from March 2020 to December 2023 in the Osh region of Kyrgyzstan, utilising data from the Osh Interregional Clinical Hospital and the Osh City Clinical Hospital. During the pandemic, the two institutions were the main places for obstetric care and played a key role in managing COVID-19 cases among pregnant women. In addition to looking back at old data, clinical observations were made in the "red" zones set aside for COVID-19 patient care. Being directly involved in patient care gave me the chance to check clinical records and see how care was given during the pandemic.

3.3 Data collection methods

The data collection primarily relied on individual pregnancy records and birth history charts which contained detailed demographic and medical and obstetric and perinatal information. The clinical observations in “red” zones during pandemic peaks delivered immediate information about patient care and complications and healthcare resource consumption. The laboratory assessments included PCR testing for SARS-CoV-2 along with complete blood counts and inflammatory marker analysis and obstetric-specific laboratory panels. Obstetric ultrasound examinations served as instrumental tests to assess fetal growth and placental function and identify intrauterine complications.

3.4 Data processing and analysis

The trained personnel entered all data into a Microsoft Excel database which they verified for accuracy independently. The statistical analysis of cohort studies followed established standard procedures. The analysis used descriptive statistics to present baseline demographic and clinical characteristics while comparative analyses evaluated pregnancy complications and maternal outcomes and neonatal health indicators between groups. The analysis of COVID-19 infection relationships with adverse outcomes used cross-tabulation methods. The research team interpreted findings based on local epidemiological data while referencing international evidence to make the results applicable to the Kyrgyz healthcare environment.

3.5 Ethical considerations

This study was conducted in full compliance with the principles outlined in the Declaration of Helsinki, ensuring respect for the rights, safety, and well-being of all participants [16]. Ethical approval for the research protocol was obtained from the Ethical Committee of Osh State University prior to data collection. Participation was based on informed consent, with all eligible women being informed about the study objectives, procedures, and potential risks. Data confidentiality was maintained by anonymizing patient records and restricting access to identifiable information solely to authorized research personnel. No interventions beyond routine clinical care were performed as part of this study, and all procedures adhered to national healthcare regulations and institutional guidelines.

4. Result

The study period from March 2020 to December 2023 saw 265 pregnant women receive COVID-19 diagnoses. The pandemic spread throughout the world during the first two years of the study period because most cases occurred during this time. The first two years of the study period saw 113 women (42.6%) and 112 women (42.3%) receive COVID-19 diagnoses. The number of cases decreased substantially after 2021 because 35 women (13.2%) received diagnoses in 2022 and only 5 women (1.92%) received diagnoses in 2023. The decrease in cases occurred when mass vaccination programs started and infection control measures improved and community immunity levels increased.

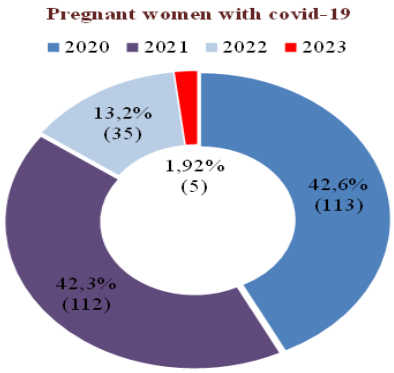


Figure 1. Pregnant women with Covid-19

clinical progression of COVID-19 was mild to moderate in 80% of all cases. The disease severity was severe in 19.89% of patients and extremely severe in only 0.11% of cases, which was observed in three patients who had maternal critical illness. The data indicates that pregnancy did not necessarily lead to the most severe forms of COVID-19, although a significant minority required intensive monitoring.

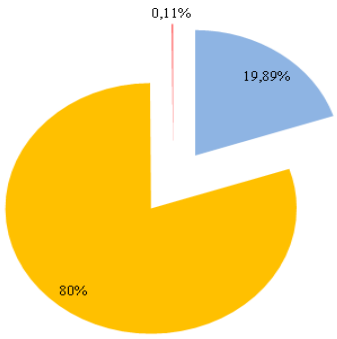


Figure 2. According to the severity of Covid-19

4.1 Clinical presentation

The most common symptom among symptomatic patients was fever which occurred in 88% of cases and reached temperatures above 38.0°C when patients first arrived at the hospital. The cough symptom appeared in 60% of women but only 24% showed signs of systemic intoxication through chills and myalgia and malaise. The medical diagnosis of pneumonia through radiological or clinical examination confirmed its presence in 98.6% of patients who showed respiratory symptoms. The remaining 20% of patients showed symptoms which resembled acute respiratory viral infections. The need for oxygen therapy emerged in 10% of patients because their hypoxia levels ranged from moderate to severe.

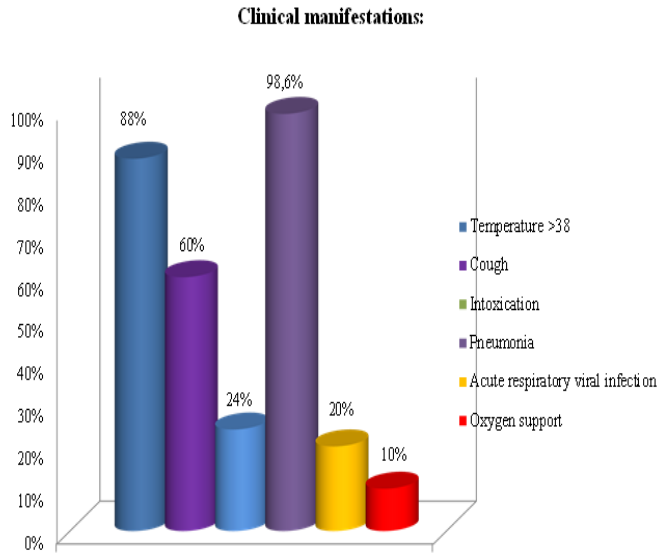


Figure 3. Clinical manifestations of Covid-19

Pregnancy-related complications

The pregnancy course of women infected with COVID-19 often developed multiple obstetric complications. The two most prevalent pregnancy complications among patients were hypertensive disorders of pregnancy which occurred in 6.5% of cases and premature birth threats which affected 40% (n=104) of patients. The pregnancy complications gestational pyelonephritis and gestational diabetes mellitus and frozen pregnancy occurred at lower rates with 1.5% and 1.5% and 0.7% (n=2) respectively. The high prevalence of iron deficiency anemia at 87% (n=230) among patients

created additional risks from COVID-19 hypoxia.

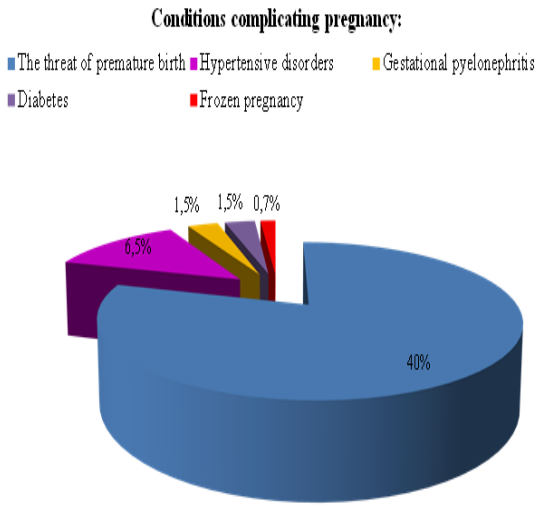


Figure 4. Complications of pregnancy

The research data showed that pregnant women infected with COVID-19 did not develop more serious illness than non-pregnant people. The cohort showed an increased risk of preterm delivery because maternal and fetal compromise occurred when maternal oxygen saturation decreased. The infection itself did not appear to increase the incidence of obstetric complications.

No evidence was found to support vertical transmission of SARS-CoV-2. Perinatal outcomes were evaluated in detail. Among 265 pregnant women, 71 (26.8%) had completed their pregnancies during the study period, while 194 (73.2%) were discharged with ongoing pregnancies in satisfactory condition. Frozen pregnancy occurred in 2 cases (0.07%). Of the 71 deliveries, 61 (85.9%) were vaginal births, 56 (91.8%) of which were urgent. Caesarean section was performed in 10 cases (14.0%). Preterm birth occurred in 5 cases (0.8%), including two very early preterm deliveries. One stillbirth was recorded at 27 weeks' gestation; the fetus weighed 920 g, and the mother had presented with cough and fever up to 38.5°C. Newborn anthropometric parameters were comparable to population norms, with a mean birth weight of 3210.5 g and mean length of 50.41 cm. The average Apgar scores were 6.72 at 1 minute and 7.65 at 5 minutes. Mean maternal blood loss at delivery was 381.19 ml.

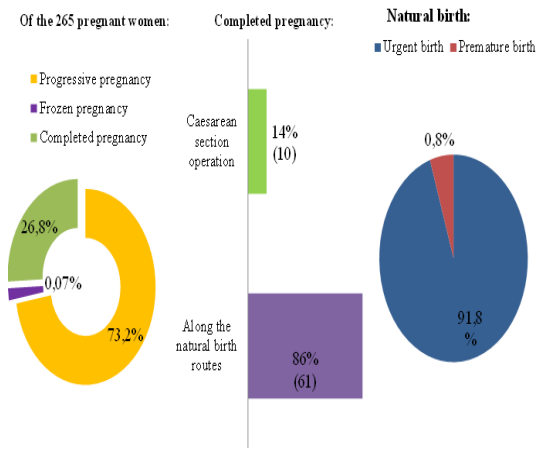


Figure 5. Pregnancy outcomes

4.4 COVID-19 antibody testing and diagnostic limitations

The researchers studied 265 pregnant women who received complete clinical and laboratory assessments except for fetal Doppler studies. The participants received COVID-19 rapid antibody tests at admission followed by serological confirmation tests. The rapid testing produced positive results in 217 cases which made up 81.9% of the total. The annual distribution of positive cases was as follows: 81 cases (37.3%) in 2020, 98 cases (45.2%) in 2021, 33 cases (15.2%) in 2022, and 5 cases (2.3%) in 2023. The pandemic restrictions known as the "red zone" prevented fetal Doppler assessments because the facilities lacked both Doppler ultrasound equipment and trained specialists.

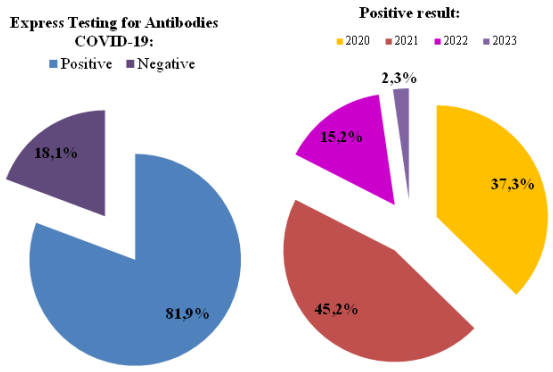


Figure 6. The results of rapid testing

Upon hospital admission, pregnant women with confirmed COVID-19 most frequently presented with fever, cough, and shortness of breath. Other common symptoms included muscle pain, anosmia, ageusia,

loss of appetite, generalized weakness, fatigue, and various dyspeptic complaints. Laboratory diagnostics encompassed detection of SARS-CoV-2 RNA via nucleic acid amplification techniques (polymerase chain reaction, PCR) and measurement of SARS-CoV-2 immunoglobulins of classes M and G using enzyme immunoassay and immunochemiluminescence methods. Additional laboratory parameters assessed included D-dimer, prothrombin time, fibrinogen, C-reactive protein, procalcitonin, and ferritin levels. Instrumental diagnostic methods included pulse oximetry to evaluate peripheral oxygen saturation, computed tomography (CT) of the lungs, ultrasound examination of the lungs and pleural cavities, and chest radiography. CT findings revealed pneumonia in 238 cases (89.8%), predominantly presenting as mild to moderate bilateral involvement. In 27 cases (10.2%), CT scans were not performed.

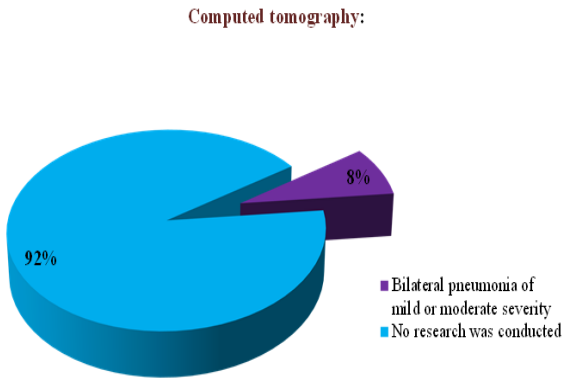


Figure 7. Computed tomography of the lungs

4.5 Laboratory parameters, therapeutic approaches, and in-hospital complications

The laboratory tests performed on pregnant women with COVID-19 showed various haematological and inflammatory changes which included leukopenia, lymphopenia, thrombocytopenia, elevated erythrocyte sedimentation rate (ESR), increased lactate dehydrogenase, ferritin, C-reactive protein, interleukin-6, fibrinogen, and D-dimer levels. The research confirms that hyperimmune responses together with increased thrombotic activity play a crucial role in COVID-19 development during pregnancy. The participating maternity hospitals Osh Interregional Clinical Hospital and Osh City Clinical Hospital implemented antiviral and anti-inflammatory and antithrombotic treatments together with symptomatic care and respiratory support according to clinical needs. The observed hospital complications among this patient group included respiratory failure and coagulopathies and DIC syndrome and cardiovascular insufficiency and secondary bacterial infections and pneumonia with septic shock and acute renal failure.

4.6 Demographic Characteristics

Among the 265 pregnant women included in the study, age distribution revealed that 5% were younger than 25 years, the majority (55%) were between 20–29 years, and 40% were between 30–40 years. The mean maternal age was 28.5 ± 4.3 years. Ethnic composition showed that Kyrgyz women represented the majority at 65%, followed by Uzbek women at 25%, while 10% belonged to other ethnic groups.

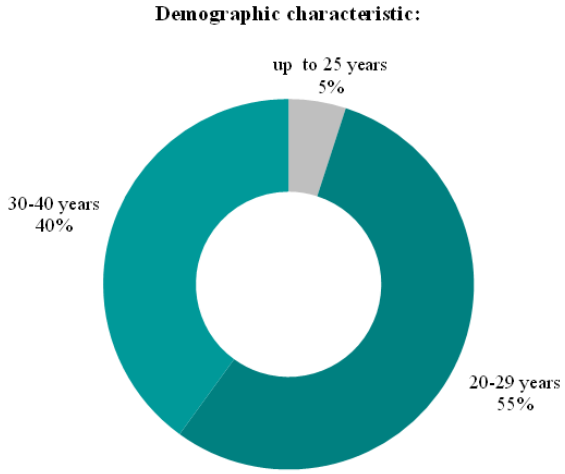


Figure 8. Age distribution

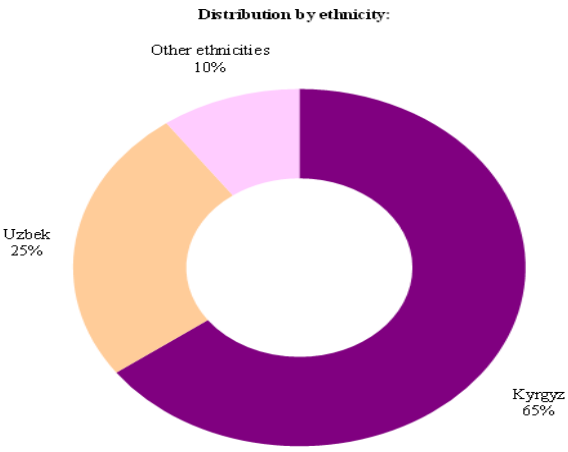


Figure 9. Distribution by ethnicity

4.7 Gestational age at time of infection

The 25% of infections occurred during the first trimester while 40% occurred during the second trimester and 35% occurred during the third trimester. The majority of infections happened during mid to late pregnancy which are periods of high physiological demands and increased respiratory illness vulnerability.

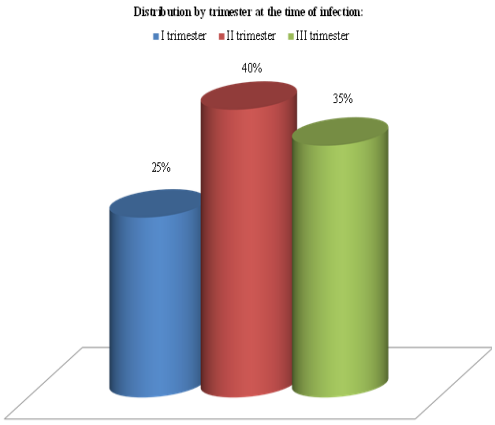


Figure 10. Distribution by trimester

4.8 Clinical manifestations of COVID-19 in pregnant women

The disease symptoms differed among members of the cohort. The disease presented without symptoms in 30% of women. The majority of patients had mild disease at 60% while moderate disease affected 20% of patients and severe disease affected 19.89% of patients and extremely severe disease affected 0.11% of patients.

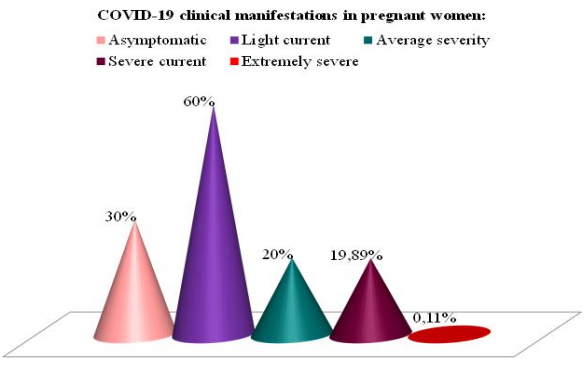
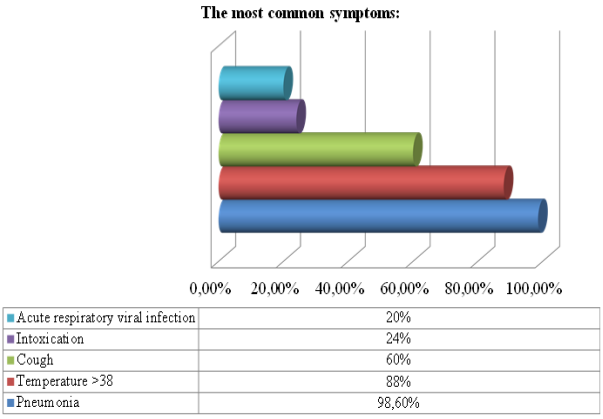


Figure 11. Clinical manifestations

4.9 Common clinical symptoms

Radiologically confirmed pneumonia was the most common clinical finding, showing up in 98.6% of cases. Eighty-eight percent of patients had a fever above 38.0 °C, and sixty percent had a cough. There were also reports of systemic intoxication symptoms (24%) and symptoms that matched those of acute respiratory viral infections (20%).



Acute respiratory viral infection	20%
Intoxication	24%
Cough	60%
Temperature >38	88%
Pneumonia	98,60%

Figure 12. Common symptoms

4.10 Pregnancy complications

The frequency of specific maternal complications during COVID-19 pregnancy exceeded control data findings. The control group showed a lower rate of hypertensive disorders at 3.2% compared to 6.5% in the cases ($p < 0.001$). The incidence of gestational diabetes was 1.5% in cases while the control group reported 0.6% ($p < 0.05$). The preterm birth rate in cases exceeded the control group rate at 0.8% compared to 0.5% ($p < 0.001$).

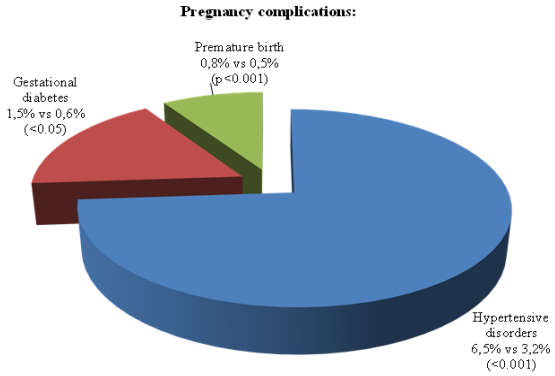


Figure 13. Pregnancy complications

4.11 Pregnancy outcomes

Of all deliveries in the COVID-19 group, emergency delivery was required in 91.8% of cases compared to 90% in the control group. Preterm birth occurred in 0.8% of cases (vs. 0.5% in controls; $p < 0.001$). Caesarean section was performed in 14% of cases, slightly higher than the 13.2% rate in the control group ($p < 0.01$). The mean birth weight of neonates in the COVID-19 group was 3210 ± 450 g, which was marginally lower than the 3300 ± 400 g observed in the control group ($p < 0.05$).

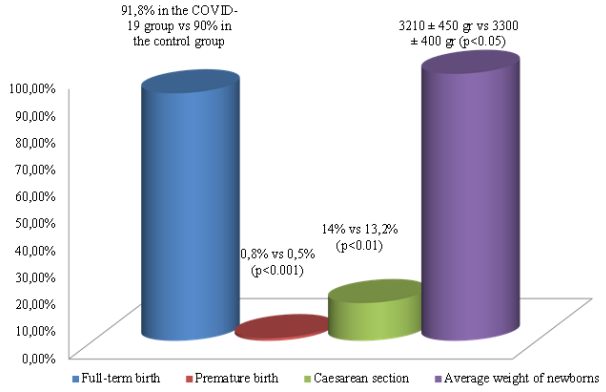


Figure 14. Pregnancy outcomes

4.12 Neonatal outcomes

The study cohort showed no evidence of SARS-CoV-2 vertical transmission. The study revealed that newborns from mothers with COVID-19 showed a slightly elevated rate of Apgar scores below 7 at the fifth minute (7.65%) compared to 4% in the control group ($p < 0.05$). The NICU admission rates were higher among exposed neonates (8%) than in controls (6%; $p < 0.01$). The majority of infants showed good postnatal adaptation even though some differences existed between the groups and their outcomes were similar to those of unexposed infants.

Neonatal outcomes	
Apgar score	<7 on the 5th minute: 7,65% vs 4% (p<0.05)
Hospitalization in the intensive care unit of newborns	8% vs 6% (p<0.01)
Confirmed vertical transmission SARS-CoV-2	0 cases (0%)

Figure 15. Neonatal outcomes

5. Discussion

The prospective cohort study produced important findings about COVID-19 clinical progression and pregnancy complications and birth results among Osh city and Osh region women with confirmed COVID-19 from 2019 to 2023. The majority of cases occurred in the second and third trimesters which matches global observations that later pregnancy stages increase the risk of severe respiratory illness because of cardiopulmonary function changes and immune system modulation. The clinical progression for most women remained mild to moderate even though theoretical vulnerabilities existed yet the overall disease severity matched that of the general population. The study showed that 0.11% of patients developed an extremely severe condition and 19.89% received severe case classification [17]. The study supports international findings that pregnancy does not automatically lead to critical illness yet our cohort showed 98.6% of patients had pneumonia confirmed by radiology despite non-life-threatening illness. The symptom profile consisted mainly of fever cough and pneumonia which are common COVID-19 respiratory symptoms while systemic features such as intoxication and ARVI-like presentations appeared less often.

The obstetric data show a small but quantifiable rise in negative maternal outcomes among women infected with COVID-19 compared to uninfected controls. The infected group exhibited elevated rates of hypertensive disorders, gestational diabetes, and premature birth in comparison to controls, with statistically significant differences. The association between COVID-19 and hypertensive disorders may arise from shared pathogenic mechanisms that impact endothelial cells and initiate inflammatory responses [18]. The observed preterm birth rate in less than 1% of COVID-19 patients might result from maternal hypoxemia and systemic inflammation and iatrogenic preterm delivery because of deteriorating maternal or fetal health. The infection does not cause uniform disruption to pregnancy progression since other obstetric complications remain unchanged yet healthcare providers should remain alert to potential unpredictable worsening of patient conditions. The COVID-19 group delivered their babies under urgent conditions because of both the sudden illness presentation in some cases and hospital policies during the pandemic that led to faster delivery

decisions [19].

The study results show that SARS-CoV-2 vertical transmission is unlikely because no newborns tested positive for the virus. The majority of infants received satisfactory Apgar scores and their anthropometric measures matched the general population but the COVID-19 group showed slightly higher rates of low Apgar scores at five minutes and NICU admissions [20]. The statistically significant differences were small in clinical terms and might stem from short-term perinatal distress or safety protocols instead of serious neonatal complications. The birth weights of newborns from infected mothers averaged slightly lower than normal but remained within typical ranges [21]. The systemic inflammatory and metabolic effects of maternal infection together with reduced placental perfusion and prolonged maternal illness might explain this finding. The survival rates of newborns in our study match international research findings which demonstrate that proper medical care and observation leads to positive outcomes for most pregnancies exposed to COVID-19. The pandemic restrictions which limited healthcare access particularly in Kyrgyzstan's remote regions influenced both the observed risk factors and clinical developments thus demonstrating the need to enhance maternal healthcare delivery systems during future public health emergencies [22].

6. Future recommendations

The research findings generate various strategic recommendations which focus on improving COVID-19 management and pregnancy-related outcomes for women. The recommendations focus on improving preventive measures while building clinical preparedness and securing proper maternal and neonatal care for areas with restricted healthcare capabilities.

6.1 strengthening access to antenatal care in remote areas: The main priority should be to expand mobile healthcare units and telemedicine platforms and emergency referral systems to deliver prompt antenatal and COVID-19-related care to pregnant women in remote areas [23,31].

6.2 Integrating COVID-19 screening into routine pregnancy checkups: Standardized COVID-19 screening protocols that include rapid antigen and antibody testing during antenatal visits enable healthcare providers to detect infections in pregnant women at an early stage for immediate treatment [24].

6.3 Enhancing Clinical Training for Obstetric Teams: The healthcare system should create ongoing professional development programs for obstetricians, midwives and nursing staff to concentrate on respiratory infection diagnosis and management during pregnancy with a focus on pneumonia, oxygen therapy and infection prevention [25].

6.4. Establishing dedicated maternity COVID-19 Units: Hospitals should consider creating specialized maternity wards equipped with isolation facilities, advanced fetal monitoring tools, and respiratory support systems to ensure safe care for infected pregnant women without disrupting routine obstetric services [26].

6.5. Long-Term maternal and neonatal follow-up programs: Structured follow-up initiatives should be developed to monitor mothers and infants affected by COVID-19 during pregnancy, with an emphasis on evaluating long-term physical health, neurodevelopmental outcomes, and potential post-infection complications [27].

Conclusion

This multicenter observational study not only provides a comprehensive assessment of COVID-19 infection in pregnant women across Osh city and its surrounding area from March 2020 to December 2023 but also shows that COVID-19 in pregnancy followed a similar clinical pattern to the general population with most cases showing mild to moderate disease. Nevertheless, maternal hypoxaemia was associated with an increased risk of premature birth, and pregnancy complications, including hypertensive disorders and gestational diabetes, occurred with greater frequency than in non-infected controls. Perinatal outcomes were largely favourable, with most neonates demonstrating normal anthropometric parameters and Apgar scores within the expected range. Significantly, there were no cases of vertical transmission reported. Nonetheless, complicated deviations in newborn adaption, seen by marginally

elevated low Apgar score rates at 5 minutes and a rise in admissions to neonatal critical care units, necessitate ongoing monitoring and follow-up. The research demonstrates that maternal health infrastructure requires ongoing funding support especially in areas with limited resources while showing the value of identifying high-risk pregnancies early during infectious disease outbreaks. Future pandemics require improved diagnostic capabilities and immediate respiratory support access and obstetric and infectious disease expertise integration to reduce adverse maternal and perinatal results.

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