We aimed to summarize reliable medical evidence by the meta-analysis of all published retrospective studies that examined data based on the detection of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by clinical symptoms, molecular (RT-PCR) diagnosis, and characteristic CT imaging features in pregnant women. The MEDLINE, PubMed, Scopus, ISI Web of Science, ClinicalKey, and CINAHL databases were used to select the studies. Then, 384 articles were received, including the studies until 01/May/2020. As a result of the full-text evaluation, 12 retrospective articles covering all the data related were selected. A total of 181 pregnant cases with SARS-CoV-2 infections were included in the meta-analysis within the scope of these articles. According to the results, the incidence of fever was 38.1% (95% CI: 14.2-65%) and cough was 22% (95% CI: 10.8-35.2%) among all clinical features of pregnant cases with SARS-CoV-2 infection. So, fever and cough are the most common symptoms in pregnant cases with SARS-CoV-2 infection. Moreover, abnormal CT incidence is 97.9% (95% CI: 94.2-99.9%) positive. No case was death. However, as this virus spreads globally, it should not be overlooked that the incidence will increase in pregnant women and maybe in the risky group. RT-PCR and CT can be used together in an accurate and safe diagnosis. In conclusion, these findings will provide important guidance for current studies regarding the clinical features and correct detection of SARS-CoV-2 infection in pregnant women, as well as whether it will create emergency tables that will require the use of a viral drug.
with MERS-CoV and SARS-CoV [5]. Besides, it has been reported that SARS-CoV-2 is 96% identical to a bat coronavirus throughout its genome [6, 7].

The pandemic spreading can be fatal when healthcare professionals are not ready to manage the infection, as now seen in the COVID-19 outbreak. The SARS-CoV-2 virus was also isolated from asymptomatic individuals, and affected patients showed contagiousness even 2 weeks after symptoms ceased [8]. Thus, it required radical measures on all continents, including closing the country’s borders.

As the epidemic of COVID-19 spreads rapidly, pregnant women have drawn attention to the prevention and control of COVID-19 infection due to being at risk of respiratory infection, especially flu. Physiological and mechanical changes in pregnancy increase susceptibility to infections in general and promote rapid progression to respiratory failure, especially when the cardiovascular system is affected. Thus, they represent a high-risk group during infectious outbreaks [8].

All these risk factors cause an essential point to examine pregnant women. Clinical features and the functionality of the methods of detection of SARS-CoV-2 infection in pregnant women are currently the focus of attention in medical studies, though, owing to the different designs of different clinical trials and small sample sizes, published trials are also various [2]. The goal of this study was to examine all these articles about the detection of SARS-CoV-2 in pregnant women with molecular (PCR) and CT imaging methods, the frequency of occurrence of these clinical features, and also the detection correction of the methods used in diagnosis by meta-analysis.

2. Material and Methods

2.1. Sources of Information. MEDLINE, PubMed, Scopus, ClinicalKey Library, CINAHL (Cumulative Index to Nursing and Allied Health Literature), and ISI Web of Science were searched using combined keywords: “2019-nCoV and/or pregnancy,” “COVID-19 and/or pregnancy,” and “SARS-CoV-2 and/or pregnancy.”

2.2. Article Selection and Publication Quality Evaluation. Meta-analysis was elaborated according to the PRISMA guidelines [9]. The literature search and selection process are presented in Figure 1, which was conducted according to the PRISMA flowchart. The two authors (BUC, BAB) reviewed all the literature independently. The agreement on potential relevance or inconsistencies has been reached unanimously, or a decision was made by discussing with a third reviewer (ÖP).

As a result of the electronic database search, we received 394 articles and 17 of them were excluded due to repeated access. Finally, 12 unique studies were selected that reported on clinical properties and diagnostic methods. The meta-
analysis was done using 12 articles ([10–13]; [14–21]) with a total of 181 patients that satisfied the study criteria. The Newcastle-Ottawa Scale (NOS) was used to assess the quality of included studies [22]. The quality scores of all varied from 0 to 9 (Table 1).

2.3. Statistical Analysis. The meta-analysis of incidence rates was conducted using the “metafor” package in R version 3.6.2 [23]. It includes 12 studies, with a total of 181 patients. We employed the random-effects model according to assessing heterogeneity of the meta-analysis.

The publication bias was detected by Egger’s test. The test results and corresponding P values are presented in Table 2. Egger’s test indicated that publication bias exists for diarrhea and RT-PCR groups (P = 0.019 and P = 0.025, respectively).

The double arcsine transformation was applied in order to make the skewed distribution of proportions conform to the normal distribution [24, 25]. To conclude, we performed the inverse of the double arcsine transformation for proportions using the harmonic mean of the sample sizes for the back-transformation. The results are given for the summary incidence rate and confidence interval in Table 3.

3. Results

The incidence of fever was 38% (95% CI: 14-35%) and cough was 22% (95% CI: 10.8-35.2%) among all clinical features of pregnant cases with SARS-CoV-2 infection by meta-analysis. Dyspnea was observed in only 3.3% (95% CI: 0.3-8.2%). The incidence of positive RT-PCR is 91.8% (95% CI: 76.7-99.9%), and the incidence of abnormal computer tomography (CT) is 97.9% (95% CI: 94.2-99.9%).

Since no clinical signs of vomiting were found in any of the studies included in the analysis, the effect size was not given for it. Detailed results of the meta-analysis are shown in Table 3.

The most common symptoms are fever (38.1%) and cough (22%), and the less common symptoms are dyspnea (3.3%), myalgia and/or fatigue (3%), diarrhea (0.4%), and sore throat (0.2%). The point estimate of the runny nose was found as 0.0%. The confidence interval of a clinical finding of runny nose among pregnant women is between 0.000 and 0.010 with a 95% confidence level. The incidence of CT is higher than RT-PCR to diagnose COVID-19. Besides, the confidence interval of CT is narrower than RT-PCR.

4. Discussion

In the early stages of the SARS-CoV-2 epidemic, the case death rate is estimated to be approximately 2% [2]. Later, it is reported that the death rate in China was 3.8%, which was lower than that of the two commonly transmitted zoonotic CoV diseases, SARS and MERS [6].

SARS-CoV-2 infection is more likely to affect older people with comorbidity, with most deaths clustering in this particular population [6, 26, 27]. The mortality rates of SARS and MERS infections are 9.6% [3] and 35%, respectively [28]. Xie et al. [29] stated that 45% of patients showed symptoms of pulmonary fibrosis within 1 month after infection with SARS-CoV and 30-36% after 3-6 months. These studies suggested that pulmonary fibrosis will be one of the serious complications in patients with SARS-CoV-2 infection. Furthermore, due to the low mortality rate of SARS-CoV-2 infection and rapid spread among patients compared to SARS-CoV and MERS-CoV infections, a large number of patients require treatment. In this case, health equipment and health worker competence have been essential. Thus, COVID-19 threatens preparedness and biosecurity conditions in all countries [30]. At the same time, both of these coronaviruses can cause death in a few but significant numbers of pregnant cases, but specific risk factors for a fatal outcome during pregnancy have not been clarified [2].

In addition, in another study ([31]), they found that in healthy lung tissue, the angiotensin-converting enzyme 2 (ACE2) SARS-CoV-2 receptor is mainly expressed by type I and type II alveolar epithelial cells. Type II alveolar cells (83%) have been reported to express ACE2. For this reason, SARS-CoV-2 infection damages most of the type II alveolar cells. The use of mechanical ventilation in the treatment of patients can also aggravate the damage of alveolar cells. However, it has also been reported that ACE2 is more expressive in pregnant women [32, 33].

Compared with past coronavirus pandemics, it has been reported that pregnancy has a significant impact on the course of the disease of SARS-CoV and the outcome of an infected patient. Therefore, the duration of the hospital stay of pregnant patients was longer. In addition to kidney failure, sepsis, or common intravascular coagulation disorder, the need for intensive care treatment was more common in pregnant women. The mortality of pregnant infected patients has also increased significantly [34]. So far, there is very little data on MERS-CoV infection during pregnancy. However, 11 reported symptomatic cases [35] showed a more severe course in pregnancy than SARS-CoV infection.

In addition to information about the effects of previous coronavirus outbreaks on pregnant women, little data is known about the clinical course, possible risks, and the validity of the methods used in the correct diagnosis for pregnant patients infected with SARS-CoV-2. In this study, a meta-analysis of the data of publications examining these possible risks and methods used in diagnosis for pregnant women suffering from SARS-CoV-2 infection was performed. The results we found in pregnant women with SARS-CoV-2 infections are common symptoms of fever, cough, shortness of breath, general myalgia, weakness, diarrhea, dyspnea, and pneumonia compared to the primary clinical symptoms in pregnant women with MERS-CoV and SARS-CoV infections [6].

When we compare our results of the meta-analysis for pregnant women with the rates of the study conducted with the nonpregnant adult group [2], respectively, the incidence of fever was 38% (89.1%), the incidence of cough was 22% (72.2%), and the incidence of myalgia and/or fatigue was 3% (42.5%). The incidence of dyspnea is 3.3% (14.8%), the incidence of abnormal CT is 98% (96.6%), and the case
| Author    | Journal name               | Date (M/D) | No. of patients | Study type       | Age   | Article quality | Clinical, molecular, and imaging findings |
|-----------|----------------------------|------------|-----------------|------------------|-------|-----------------|------------------------------------------|
| Chen et al. | *Lancet*                  | 03/07      | 9               | Retrospective    | 26-40 | 8               | Fever, Cough, Sore throat, Myalgia and/or fatigue, Dyspnea, Diarrhea, RT-PCR, CT |
| Liu et al.  | *J Infect*                | 03/02      | 41              | Retrospective    | 22-42 | 8               | Fever, Cough, Myalgia and/or fatigue, Dyspnea, RT-PCR, CT |
| Yu et al.    | *Lancet Infect Dis*       | 03/24      | 7               | Retrospective    | 29-34 | 7               | Fever, Cough, Dyspnea, Diarrhea, RT-PCR, CT |
| Zhu et al.   | *Trans Pediatr*           | 02/10      | 9               | Retrospective    | 25-35 | 6               | Fever, Cough, Sore throat, Diarrhea, RT-PCR, CT |
| Chen et al.  | *Zhonghua Bing Li Xue Za Zhi* | 03/01     | 3               | Retrospective    | 23-34 | 6               | Fever, RT-PCR, CT |
| Zhang et al. | *Zhonghua Fu Chan Ke Za Zhi* | 03/08     | 16              | Retrospective    | 24-34 | 7               | Cough, Dyspnea, Diarrhea, RT-PCR |

Table 1: Characteristics of the included studies on COVID-19, 2020.
| Author  | Journal name       | Date (M/D) | No. of patients | Study type     | Age     | Article quality | Clinical, molecular, and imaging findings |
|---------|--------------------|------------|----------------|----------------|---------|-----------------|------------------------------------------|
| Wu et al. | *Int J Gynaecol Obstet* | 04/08      | 23             | Retrospective  | 22-37  | 8               | CT |
|         |                    |            |                |                |         |                 | Fever                                    |
|         |                    |            |                |                |         |                 | Cough                                    |
|         |                    |            |                |                |         |                 | Runny nose                               |
|         |                    |            |                |                |         |                 | RT-PCR                                   |
|         |                    |            |                |                |         |                 | CT                                       |
| Liu et al. | *AJR Am J Roentgenol* | 03/06      | 15             | Retrospective  | 23-40  | 7               | CT |
|         |                    |            |                |                |         |                 | Fever                                    |
|         |                    |            |                |                |         |                 | Cough                                    |
|         |                    |            |                |                |         |                 | Sore throat                              |
|         |                    |            |                |                |         |                 | Myalgia and/or fatigue                   |
|         |                    |            |                |                |         |                 | Dyspnea                                  |
|         |                    |            |                |                |         |                 | Diarrhea                                 |
|         |                    |            |                |                |         |                 | RT-PCR                                   |
|         |                    |            |                |                |         |                 | CT                                       |
| Chen et al. | *J Med Virol*       | 03/28      | 5              | Retrospective  | 25-31  | 7               | CT |
|         |                    |            |                |                |         |                 | Cough                                    |
|         |                    |            |                |                |         |                 | Runny nose                               |
|         |                    |            |                |                |         |                 | RT-PCR                                   |
|         |                    |            |                |                |         |                 | CT                                       |
| Yang et al. | *J Infect*          | 04/12      | 13             | Retrospective  | 30.2*  | 8               | CT |
|         |                    |            |                |                |         |                 | Fever                                    |
|         |                    |            |                |                |         |                 | Cough                                    |
|         |                    |            |                |                |         |                 | RT-PCR                                   |
|         |                    |            |                |                |         |                 | CT                                       |
| Li et al.  | *Clin Infect Dis*   | 03/30      | 34             | Case-control   | 25-35  | 8               | CT |
|         |                    |            |                |                |         |                 | Fever                                    |
|         |                    |            |                |                |         |                 | Cough                                    |
|         |                    |            |                |                |         |                 | Sore throat                              |
|         |                    |            |                |                |         |                 | Dyspnea                                  |
|         |                    |            |                |                |         |                 | RT-PCR                                   |
|         |                    |            |                |                |         |                 | CT                                       |
| Wu et al.  | *Virol Sin*         | 04/10      | 6              | Retrospective  | 26-35  | 8               | RT-PCR                                   |
|         |                    |            |                |                |         |                 | CT                                       |

*Age is given as a mean value of 30.2.
patterns may also be confused with in change with the eyes of the radiologist, and these nontypical typical images for the diagnosis of COVID-19 and may may be due to the fact that these patterns may not be very

eral irregular shading [6, 37, 38]. The ratio in CT (97.9%) may be noted that there is radiation in the CT examina-

fination, so the question of whether the reexamination interval

should be covered in this study. As a result, the importance

tines positive in pregnant women. However, it

is not included in the meta-analysis, since deaths were

molecular, and CT diagnostic features of COVID-19. Also, it
data in this analysis allow for the

rmination, has been deemed necessary to pre-

vent contamination from health workers during close contact in

pregnant women [30, 39, 40].

Here, we have discussed 12 articles, including 181 pregnant
cases with SARS-CoV-2 infection. So far, it is the first meta-

alysis to examine the factors and prenatal clinical features

that may be effective in initial diagnosis in pregnant women.
The quality of the literature included in this study is high. How-
ever, this review also has some limitations. As of the current
period, there are few studies for the content. Data from all
countries are urgently needed on this issue. Thus, it would be
more appropriate to include a large number of studies in a
broad geographical scope in order to obtain a more compre-
hensive view of COVID-19 in pregnant women as a result.
Since detailed patient information was not given in all studies,
especially regarding clinical findings, chronic diseases, or com-
plications of pregnants, these factors could not be included in
the meta-analysis. In particular, there were negative results,
although the case showed positive clinical signs, since CT con-
tained radiation, and its use was not preferred or repeated. The
data in this analysis allow for the first synthesis of the clinical,
molecular, and CT diagnostic features of COVID-19. Also, it
is not included in the meta-analysis results, since deaths were
not reported in pregnant women in the studies conducted. In
this study, the patients were diagnosed with SARS-CoV-2
infection. However, because the clinical symptoms are rare in
the findings of our study, the prevalence of asymptomatic cases
may be higher among pregnant women. As there is a lack of
data in newborns as part of the studies we have included, it
could not be covered in this study. As a result, the importance
of vertical transmission is not emphasized.

Based on the limitations reported above, the results need to
be supported by more extensive studies with larger sample sizes.
Further clinical data are essential to explain the clinical
spectrum of the disease. Clinical experience case reports, case
series, or extensive observational studies from countries with
an increasing number of cases will contribute significantly.

Pregnant women are sensitive to respiratory pathogens and
the development of severe pneumonia, making them
more susceptible to COVID-19 infection, especially if they
have chronic diseases or complications [41]. Therefore, preg-
nant women should be considered a critical risk group in the
prevention and treatment of COVID-19. In addition to
recent studies, previous pandemic experiences should be

| Fever | Cough | Dyspnea | Myalgia and/or fatigue | Diarrhea | Sore throat | Runny nose | CT | RT-PCR |
|-------|-------|---------|------------------------|----------|-------------|------------|----|--------|
| 0.317 | 0.220 | 0.897   | 0.923                  | 0.019    | 0.114       | 0.130      | 0.460 | 0.025  |

Table 2: Egger’s test results of clinical, molecular, and imaging characteristics in pregnancy.

Table 3: Meta-analysis results of clinical, molecular, and imaging characteristics in pregnancy.

| Clinical, molecular, and imaging findings | Results of meta-analysis | Lower limit | Upper limit |
|------------------------------------------|--------------------------|-------------|-------------|
| Fever                                    | 0.381                    | 0.142       | 0.650       |
| Cough                                    | 0.220                    | 0.108       | 0.352       |
| Dyspnea                                  | 0.033                    | 0.003       | 0.082       |
| Myalgia and/or fatigue                   | 0.030                    | 0.000       | 0.115       |
| Diarrhea                                 | 0.004                    | 0.000       | 0.036       |
| Sore throat                              | 0.002                    | 0.000       | 0.028       |
| Runny nose                               | 0.000                    | 0.000       | 0.010       |
| CT                                       | 0.979                    | 0.942       | 0.999       |
| RT-PCR                                   | 0.918                    | 0.767       | 0.999       |

Microorganism diagnostic tests that can be done to eliminate similar images can be time-consuming.

The results of this meta-analysis study here highlight the clinical, molecular, and imaging findings of COVID-19 preg-
nant cases that may assist clinicians. In this way, it will pre-
vent further contamination by implementing infection control measures, thanks to early recognition of cases and ade-
quate intervention by clinicians. Frequent evaluation of available evidence of COVID-19, such as clinical suspicion
and definitive diagnosis, has been deemed necessary to pre-
vent contamination from health workers during close contact in
pregnant women [30, 39, 40].

fatality rate of patients with SARS-CoV-2 infection is 4.3%
[6, 10–12, 14–21, 27]. In addition, symptoms of diarrhea,
sore throat, and runny nose are rare. Mechanical ventilation
was not required in pregnant women; also, there were no
reported cases of death. Egger’s test was used to provide a test
statistic for the presence of publication bias in the data.
Egger’s test was found only significant for diarrhea and RT-
PCR. It appeared to be mainly caused by “study 2” with large
sample size. However, we did not exclude this study for two
reasons. The first reason is that Egger’s test was not found
significant for the others. The second reason is that removing
“study 2” would decrease the total sample size.

All irregularities in the imaging results were considered
abnormal for the CT result. According to our RT-PCR and
CT results (91.8-97.9%, respectively), we think that both
should be used when evaluating to say that the cases are cor-
rect and definite positive in pregnant women. However, it
should be noted that there is radiation in the CT examina-
tion, so the question of whether the reexamination interval
is necessary for the treatment of pregnant women with mild
symptoms needs further discussion.

Besides, low doses during the use phase for pregnant
women should be paid attention to. Based on the above,
COVID-19 has mild clinical signs in pregnant women; some
are asymptomatic and need to be combined with epidemi-
ological history and nucleic acid detection. It also emphasizes
that this rate (91.8%) of RT-PCR may be a false-negative
result. This suggests that it may be due to early samples taken
for diagnosis or asymptomatic cases.

Guan et al. [36] stated that frequent patterns in chest CT
include abnormal findings in the case reports, including
asymptomatic patients, with ground-glass opacity and bilat-
eral irregular shading [6, 37, 38]. The ratio in CT (97.9%) may be due to the fact that these patterns may not be very
typical images for the diagnosis of COVID-19 and may change with the eyes of the radiologist, and these nontypical
patterns may also be confused with influenza-like images.
considered in the prevention and control of this infection. Our findings will provide valuable guidance for current clinical trials. We are also of the opinion that our results can give an idea about the necessity of using a viral drug in the treatment of SARS-CoV-2 infections in pregnant women. In summary, the symptoms of pregnant women with COVID-19 are diverse; the main symptoms are fever and cough. Symptoms are relatively mild. Pregnancy did not increase the severity of COVID-19. ACE2 may not be more expressive in pregnant women. Asymptomatic individuals should be taken into consideration and should not be overlooked. CT may be more effective in diagnosis, but after evaluating the risks it carries in pregnant women, it should be administered in appropriate doses. Pregnant women with SARS-CoV-2 infection should be closely monitored for early diagnosis. Currently, pregnancy may complicate the clinical course of COVID-19, but the fact that the cases in this group are not in the risky age group defined for COVID-19 may give an idea that their condition will not be as bad as in the pregnant tables in MERS or SARS infections [2]. There may also be a need for new studies that ACE2 is not more effective in pregnant women.

5. Conclusion

Given the importance of this ongoing global public emergency situation, our results are limited to the small sample size, but we believe the findings reported here are important for understanding the clinical features of COVID-19 and the potential of diagnostic methods for pregnant women.

In line with our final results, it may be appropriate for correct diagnosis to evaluate both methods together with clinical symptoms in order to not miss the asymptomatic cases that may occur more frequently in pregnant women, with the false-negative results, or to not put an extra burden on the patient and health sector with false-positive results, especially for risky areas. Also, based on our findings, the question arises once again whether antiviral therapy is required for pregnant women with COVID-19, and all possible risks should be considered under the profit-loss balance, considering mild cases of viral drug use during pregnancy.

As a result, this pandemic will not be an end to the world and it will always be a priority to diagnose correctly and quickly in this vulnerable group in developing new treatment methods. We believe that this research may be critical in determining methods and even saving lives in the early diagnosis and treatment of pregnant women in current and future outbreaks.

Data Availability

All data generated or analyzed during this study are included in this article. We also have made all our data available on an open repository figshare (https://doi.org/10.6084/m9.figshare.12442031).

Disclosure

The paper is submitted in the preprint server according to the following link: https://www.medrxiv.org/content/10.1101/2020.06.06.20123901v1.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Authors’ Contributions

BUC designed the research model and determined the articles to be included in the study. BAB contributed to the realization of the study by applying meta-analysis. Both authors contributed to article selection and data interpretation and reviewed and approved the final article.

Acknowledgments

We thank Prof. Dr. Özlem Pata, Acibadem University, Medicine Faculty, Department of Obstetrics and Gynaecology, for reviewing this literature. We would like to express our gratitude to all healthcare professionals working hard on these challenging days.

References

[1] The Lancet, “Emerging understandings of 2019-nCoV,” The Lancet, vol. 395, no. 10, 2020.
[2] P. Sun, S. Qie, Z. Liu, J. Ren, K. Li, and J. Xi, “Clinical characteristics of hospitalized patients with SARS-CoV-2 infection: a single arm meta-analysis,” Journal of Medical Virology, vol. 92, no. 6, pp. 612–617, 2020.
[3] D. S. Hui, “Epidemic and emerging coronaviruses (severe acute respiratory syndrome and Middle East respiratory syndrome),” Clinics in Chest Medicine, vol. 38, no. 1, pp. 71–86, 2017.
[4] C. Wang, P. W. Horby, F. G. Hayden, and G. F. Gao, “A novel coronavirus outbreak of global health concern,” The Lancet, vol. 395, no. 10223, pp. 470–473, 2020.
[5] L. L. Ren, Y. M. Wang, Z. Q. Wu et al., “Identification of a novel coronavirus causing severe pneumonia in human: a descriptive study,” Chinese Medical Journal, vol. 133, no. 9, pp. 1015–1024, 2020.
[6] J. Liu, X. Zheng, Q. Tong et al., “Overlapping and discrete aspects of the pathology and pathogenesis of the emerging human pathogenic coronaviruses SARS-CoV, MERS-CoV, and 2019-nCoV,” Journal of Medical Virolology, vol. 92, no. 5, pp. 491–494, 2020.
[7] P. Zhou, X. L. Yang, X. G. Wang et al., “A pneumonia outbreak associated with a new coronavirus of probable bat origin,” Nature, vol. 579, no. 7798, pp. 270–273, 2020.
[8] P. Dashraath, J. L. J. Wong, M. X. K. Lim et al., “Coronavirus disease 2019 (COVID-19) pandemic and pregnancy,” American Journal of Obstetrics and Gynecology, vol. 222, no. 6, pp. 521–531, 2020.
[9] D. Moher, L. Shamseer, M. Clarke et al., “Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement,” Systematic Reviews, vol. 4, no. 1, 2015.
[10] H. Chen, J. Guo, C. Wang et al., “Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records,” The Lancet, vol. 395, no. 10226, pp. 809–815, 2020.
[11] S. Chen, B. Huang, and D. Luo, “Pregnant women with new coronavirus infection: a clinical characteristics and placental
pathological analysis of three cases,” Zhonghua Bing Li Xue Za Zhi = Chinese Journal of Pathology, vol. 49, 2020.

[12] S. Chen, E. Liao, D. Cao, Y. Gao, G. Sun, and Y. Shao, “Clinical analysis of pregnant women with 2019 novel coronavirus pneumonia,” Journal of Medical Virology, vol. 92, no. 9, pp. 1556–1561, 2020.

[13] N. Li and L. Han, “Maternal and neonatal outcomes of pregnant women with COVID-19 pneumonia: a case-control study,” Clinical Infectious Diseases, vol. cia352, 2020.

[14] D. Liu, L. Li, X. Wu et al., “Pregnancy and perinatal outcomes of women with coronavirus disease (COVID-19) pneumonia: a preliminary analysis,” American Journal of Roentgenology, vol. 215, no. 1, pp. 127–132, 2020.

[15] H. Liu, F. Liu, J. Li, T. Zhang, D. Wang, and W. Lan, “Clinical and CT imaging features of the COVID-19 pneumonia: focus on pregnant women and children,” Journal of Infection, vol. 80, no. 5, pp. e7–e13, 2020.

[16] C. Wu, W. Yang, X. Wu et al., “Clinical manifestation and laboratory characteristics of SARS-CoV-2 infection in pregnant women,” Virologia Sinica, vol. 35, no. 3, pp. 305–310, 2020.

[17] X. Wu, R. Sun, J. Chen, Y. Xie, S. Zhang, and X. Wang, “Radiological findings and clinical characteristics of pregnant women with COVID-19 pneumonia,” International Journal of Gynecology & Obstetrics, vol. 150, no. 1, pp. 58–63, 2020.

[18] H. Yang, G. Sun, F. Tang et al., “Clinical features and outcomes of pregnant women suspected of coronavirus disease 2019,” Journal of Infection, vol. 81, no. 1, pp. e40–e44, 2020.

[19] N. Yu, W. Li, Q. Kang et al., “Clinical features and obstetric and neonatal outcomes of pregnant patients with COVID-19 in Wuhan, China: a retrospective, single-centre, descriptive study,” The Lancet Infectious Diseases, vol. 20, no. 5, pp. 559–564, 2020.

[20] L. Zhang, Y. Jiang, M. Wei et al., “Analysis of the pregnancy outcomes in women with COVID-19 in Hubei Province,” Zhonghua Fu Chan Ke Za Zhi, vol. 55, no. 3, article E009, 2020.

[21] H. Zhu, L. Wang, C. Fang et al., “Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia,” Translational Pediatrics, vol. 9, no. 1, pp. 51–60, 2020.

[22] A. Stang, “Critical evaluation of the Newcastle-Ottawa scale for the assessment of the quality of nonrandomized studies in meta-analyses,” European Journal of Epidemiology, vol. 25, no. 9, pp. 603–605, 2010.

[23] W. Viechhbauer, “Conducting meta-analyses in R with metafor,” Journal of Statistical Software, vol. 36, no. 3, pp. 1–48, 2010.

[24] J. J. Barendregt, S. A. Doi, Y. Y. Lee, R. E. Norman, and T. Vos, “Meta-analysis of prevalence,” Journal of Epidemiology and Community Health, vol. 67, no. 11, pp. 974–978, 2013.

[25] M. J. Rousseau and J. C. Evans, “Key statistical assumptions and methods in one-arm meta-analyses with binary endpoints and low event rates, including a real-life example in the area of endoscopic colonic stenting,” Cogent Medicine, vol. 4, no. 1, 2017.

[26] N. Chen, M. Zhou, X. Dong et al., “Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study,” The Lancet, vol. 395, no. 10223, pp. 507–513, 2020.

[27] Q. Li, X. Guan, P. Wu et al., “Early transmission dynamics in Wuhan, China, of novel coronavirus–infected pneumonia,” New England Journal of Medicine, vol. 382, no. 13, pp. 1199–1207, 2020.

[28] E. I. Azhar, D. S. C. Hui, Z. A. Memish, C. Drosten, and A. Zumla, “The Middle East respiratory syndrome (MERS),” Infectious Disease Clinics of North America, vol. 33, no. 4, pp. 891–905, 2019.

[29] L. Xie, Y. Liu, Y. Xiao et al., “Follow-up study on pulmonary function and lung radiographic changes in rehabilitating severe acute respiratory syndrome patients after discharge,” Chest, vol. 127, no. 6, pp. 2119–2124, 2005.

[30] A. J. Rodriguez-Morales, J. A. Cardona-Ospina, E. Gutiérrez-Ocampo et al., “Clinical, laboratory and imaging features of COVID-19: a systematic review and meta-analysis,” Travel Medicine and Infectious Disease, vol. 34, p. 101623, 2020.

[31] Y. Zhao, Z. Zhao, Y. Wang, Y. Zhou, Y. Ma, and W. Zuo, “Single-cell RNA expression profiling of ACE2, the putative receptor of Wuhan 2019-nCoV,” Bio Rxiv Preprint, 2020.

[32] K. G. Pringle, M. A. Tadros, R. J. Callister, and E. R. Lumbers, “The expression and localization of the human placental prorenin/renin-angiotensin system throughout pregnancy: roles in trophoblast invasion and angiogenesis?,” Placenta, vol. 32, no. 12, pp. 956–962, 2011.

[33] X. Zhao, Y. Jiang, Y. Zhao et al., “Analysis of the susceptibility to COVID-19 in pregnancy and recommendations on potential drug screening,” European Journal of Clinical Microbiology & Infectious Diseases, vol. 39, no. 7, pp. 1209–1220, 2020.

[34] C. M. Lam, S. F. Wong, T. N. Leung et al., “A case-controlled study comparing clinical course and outcomes of pregnant and non-pregnant women with severe acute respiratory syndrome,” BJOG: An International Journal of Obstetrics and Gynaecology, vol. 111, no. 8, pp. 771–774, 2004.

[35] S. H. Alfaraj, J. A. Al-Tawfiq, and Z. A. Memish, “Middle East respiratory syndrome coronavirus (MERS-CoV) infection during pregnancy: report of two cases & review of the literature,” Journal of Microbiology, Immunology and Infection, vol. 52, no. 3, pp. 501–503, 2019.

[36] W. Guan, Z. Ni, Y. Hu et al., “Clinical characteristics of coronavirus Disease 2019 in China,” New England Journal of Medicine, vol. 382, no. 18, pp. 1708–1720, 2020.

[37] J. F. W. Chan, S. Yuan, K. H. Kok et al., “A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster,” The Lancet, vol. 395, no. 10223, pp. 514–523, 2020.

[38] C. Huang, Y. Wang, X. Li et al., “Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China,” The Lancet, vol. 395, no. 10223, pp. 497–506, 2020.

[39] C. Biscayart, P. Angeleri, S. Lloveras, T. S. S. Chaves, P. Schlagenhauf, and A. J. Rodríguez-Morales, “The next big threat to global health? 2019 novel coronavirus (2019-nCoV): what advice can we give to travellers? – Interim recommendations January 2020, from the Latin-American society for Travel Medicine (SLAMVI),” Travel Medicine and Infectious Disease, vol. 33, p. 101567, 2020.

[40] M. L. Holshue, C. DeBolt, S. Lindquist et al., “First case of 2019 novel coronavirus in the United States,” New England Journal of Medicine, vol. 382, no. 10, pp. 929–936, 2020.

[41] J. Qiao, “What are the risks of COVID-19 infection in pregnant women?,” The Lancet, vol. 395, no. 10226, pp. 760–762, 2020.