SJIF Impact Factor: 5.464

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 4.
Issue: 5.
Page N. 95-99
Year: 2020

Original Article www.wjahr.com

EPIDEMIOLOGICAL ANALYSIS OF PREGNANT WOMEN WITH COVID-19 IN DHAKA, BANGLADESH: A SINGLE-CENTRE RETROSPECTIVE STUDY

Dr. Irin Hossain*[1], Prof. Dr. Manzurul Haque Khan[2], Dr. M. M. Aktaruzzaman[3], Dr. Ashekur Rahman Mullick[4]

[1,4]National Institute of Preventive and Social Medicine (NIPSOM), Dhaka, Bangladesh.
[2]Directorate General of Health Services (DGHS), Dhaka, Bangladesh.
[3]Dhaka Medical College and Hospital, Dhaka, Bangladesh.

Received date: 20 July 2020 **Revised date:** 10 August 2020 **Accepted date:** 30 August 2020

***Corresponding author: Dr. Irin Hossain**

National Institute of Preventive and Social Medicine (NIPSOM), Dhaka, Bangladesh.

ABSTRACT

There is a special group in this outbreak, pregnant women, which deserve our great attention because of the physiological changes during pregnancy that make them more susceptible to virus. Pregnant women have a higher risk of serious illness and death from viral infections during pandemics such as influenza and Ebola. We conducted a retro-prospective study of 30 pregnant women with COVID-19 admitted into Mugda Medical College and Hospital, Dhaka, Bangladesh from May 1 to June 30, 2020. This study aims to describe the clinical characteristics, treatment strategies, and outcomes of pregnancy during COVID-19 to aid practitioners in managing these unique patients. The pregnant patients represented 6.4% (30/469*100) of all reported patients with COVID-19 at these hospitals during this time. The median age of the women was 30 years (interquartile range, 28.75 to 35). Women had symptoms at a median of 36 (interquartile range 33-38) completed weeks' gestation and about 16.7% (5/30) patients presented without symptoms. The most common symptoms were abdominal pain (19, 63.3%) and cough (16, 53.3%). Fever was present in 13 of 30 patients (43.3%). A total of 14 of 30 women (46.7%) were nulliparous, 14 (46.7%) had previous history of caesarean section. a total of 25 women (83.3%) had been discharged alive, 3 women (10%) transferred to other facilities for treatment purpose of other issues rather that COVID-19. Total 2 women (6.7%) were departed during this time period. In the context of the covid-19 pandemic, ongoing collection of data on the outcomes of infection during pregnancy will remain important.

KEYWORDS: Epidemiological Analysis, Pregnant Women, COVID-19 Pandemic.

INTRODUCTION

At the end of 2019 a new coronavirus disease (COVID-19) occurred in Wuhan, Hubei Province and has posed a serious threat to China and even the world.[1-12] In January 30, 2020, COVID-19 was declared a public health emergency -of international concern (PHEIC) by WHO.[1,3,4,5,10,12] There is a special group in this outbreak, pregnant women, which deserve our great attention because of the physiological changes during pregnancy that make them more susceptible to virus.[8,9,10] Pregnant women have a higher risk of serious illness and death from viral infections,[13] during pandemics such as influenza and Ebola.[14,15] In addition, viral infections tend to result in miscarriage, preterm, and so on.[14,15] And because of the existence of foetus and placenta, pregnancy brings us unique pharmacological challenges.[15,16] Pregnant women are indeed "drug orphans",[16] as the number and efficacy of drugs that can be used to treat pregnant women who are afflicted with other diseases are extremely limited.[17-21] And it is often difficult to quantify the passing degree of a drug between mother and foetus and its side effects on foetus.[22,23] Therefore, it is of great significance to understand why pregnant women are at higher risk during outbreaks of infectious disease,[24] and then design appropriate prevention methods and treatment on due consideration of pregnancy.[21,24] Understanding the clinical course of COVID-19 in the pregnant population is imperative for health providers to be able to care for the mother and her unborn foetus in a standardized way. This study aims to describe the clinical characteristics, treatment strategies, and outcomes of pregnancy during COVID-19 to aid practitioners in managing these unique patients.

MATERIALS AND METHODS

Study Population, Setting, and Design

We conducted a retro-prospective study of 30 pregnant women with COVID-19 admitted into COVID-19 dedicated Mugda Medical College and Hospital, Dhaka, Bangladesh from May 1 to June 30, 2020. All consecutive pregnant women with laboratory confirmed COVID-19 infection who were admitted into this facility during the study period were enrolled.

Data collection

Data were obtained from patient charts and the hospitals' admission records using a structured questionnaire which was adopted from Novel Coronavirus (COVID-19 Rapid Version) by Global COVID-19 Clinical Platform which was previously used in United Kingdom,[25] and China.[26] Demographic data, patient's comorbidities, treatment protocols, sign-symptoms, in-hospital complications and clinical outcomes of admitted pregnant women with COVID-19 were collected throughout each patient's hospital admission records and charts.

RESULTS

From May 1, 2020, to June 30, 2020, we identified 30 pregnant women with COVID-19 in Mugda Medical College and Hospital, Dhaka, Bangladesh. The pregnant patients represented 6.4% (30/469*100) of all reported patients with COVID-19 at these hospitals during this time. The median age of the women was 30 years (interquartile range, 28.75 to 35) **(Table 1).** Women had symptoms at a median of 36 (interquartile range 33-38) completed weeks' gestation, with most women admitted to hospital having symptoms in the third trimester of pregnancy or peripartum (25/30; 83.3%). About 16.7% (5/30) patients presented without symptoms. The most common symptoms in 30 women with available data were abdominal pain (19, 63.3%) and cough (16, 53.3%). Fever was present in 13 of 30 patients (43.3%) **(Table 1).** Majority time lapse (in days) between appearance of symptoms and hospital admission was both 4 days (9, 30.0%) **(Table 02).**

A total of 14 of 30 women (46.7%) were nulliparous, 14 (46.7%) had previous history of caesarean section. Although 9 (30.1%) women had a pre-existing chronic condition such as diabetes (5/9), bronchial asthma (2/9), or hypertension (2/9) **(Table 1).**

One (3.3%) women needed ICU/HDU support and this patient was in ICU/HDU for one day. Twelve (40%) women received oxygen therapy. Twenty-six (86.7%) women were treated with antibiotic agent. Seventeen of them were given Azithromycin, five of whom also received Ceftriaxone. Five (16.7%) women were given corticosteroids for foetal lung maturation **(Table 1).**

As of June 30, a total of 25 women (83.3%) had been discharged alive, 3 women (10%) transferred to other facilities for treatment purpose of other issues rather that COVID-19. Total 2 women (6.7%) were departed during this time period **(Table 1).**

Table 01: Baseline characteristics, complications and outcome of pregnant women with COVID-19.

Traits	**N (%) (N=30)**
Signs and symptoms	
Fever	13(43.3)
Fatigue	11(36.7)
Shortness of breath	13(43.3)
Lower chest in drawing	2(6.7)
Dry cough	16(53.3)
Cough with sputum	8(26.7)
Chest pain	3(10.0)
Muscle ache	3(10.0)
Joint pain	2 (6.7)
Headache	4 (13.3)
Abdominal pain	19(63.3)
Vomiting	5 (16.7)
Sore throat	12(40.0)
Comorbidities	
Hypertension	2(6.7)
Diabetes	5(16.7)
Asthma	2(6.7)
Chronic liver disease	1(3.3)
Treatments	
Antibiotic treatment	26(86.7)
Glucocorticoid therapy	5(16.7)
Antimalarial therapy	2(6.7)
Experimental therapy (Enoxaparin Sulphate)	8(26.7)

Oxygen inhalation	12(40.0)
ICU/HDU support	1 (3.3)
Complications	
Shock	2(6.7)
Pneumonia	1(3.3)
Anemia	7(23.3)
Outcomes at discharge	
Discharge alive	25(83.3)
Died	2(6.7)
Transfer to other facilities	3(1000)

Table 02: Time lapse (days) between appearance of symptoms and hospital admission.

Appearance of symptoms	Days	Frequency	Percent
	1	1	3.3
	2	1	3.3
	3	4	13.3
	4	9	30.0
	5	5	16.7
	6	3	10.0
	8	2	6.7
Total		**25**	**83.3**
Asymptomatic		5	16.7
Total		**30**	**100**

DISCUSSIONS

The immunosuppressed state of pregnancy confers high risk for the development of severe complications of infectious diseases, such as influenza and severe acute respiratory syndrome (SARS)[27] During the SARS pandemic of 2003, 40% of affected pregnant women required mechanical ventilation and had a case-fatality rate of 30%, compared to 13% and 11%, respectively, of a non-pregnant cohort.[28] In our study the maternal complication rate seems to be comparable to non-pregnant adults.[29] One theory is that the immunologic adaptations of pregnancy that help mothers from rejecting the foetus, a foreign entity containing paternal antigens, may also aid in mounting a less robust immune response to the virus, consequently leading to less destructive effects on the body.[30] Another is that pregnancy-related organ adaptive changes may result in protection against the virus and its effects.[30]

Within our 30 SARS-CoV-2–infected pregnant women, two cases of maternal death were reported, resulting in a considerably lower mortality rate in comparison to previous pandemics. Moreover, no patients requiring intubation and mechanical ventilation, morbidity appeared to be lower than anticipated. Although a proportion of women had comorbidities present, some of which were obstetrical in etiology, they still did not experience life-threatening manifestations of COVID-19. A recently published case series described two cases of COVID-19–related cardiomyopathy in pregnant women.[31] However, both of these patients possessed multiple risk factors for cardiac disease, and it remained unclear as to whether cardiomyopathy occurred as a direct complication of COVID-19, or secondary to multi-organ dysfunction. The present data do not suggest an increased risk of severe disease among pregnant women, as has been observed with influenza.[2] The exacerbations of respiratory disease that are observed in women during the postpartum period are likely to relate to pathophysiological changes (e.g., increased circulating blood volume) that occur in this period.[32]

LIMITATIONS

We did not approach patients to obtain additional history or biologic samples for laboratory measurement. We do not yet have complete pregnancy outcomes for women who were admitted but subsequently discharged well.

CONCLUSION

In the context of the covid-19 pandemic, ongoing collection of data on the outcomes of infection during pregnancy will remain important. Serological studies, as well as those using retrospective data to identify women with either confirmed or presumed mild infection in pregnancy, will be essential to fully assess potential effects such as congenital anomalies, miscarriage, or intrauterine foetal growth restriction.

DECLARATIONS

Funding: No funding.

Conflict of interest: No competing interests relevant to this study to disclose for all authors. Full forms submitted and on file for all authors.

Ethical approval: All the procedures were conducted following the ethical guidelines of institution's ethical committee (Institutional Review Board) at Mugda

Medical College Hospital, Bangladesh. The ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards will be followed wherever applicable.

REFERENCES

1. Hossain, I., Mullick, A. R., Khan, M. H., Ahmad, S. A., Rahman, S. and Aktaruzzaman, M. M. 'Epidemiology Distribution of 48 Diagnosed COVID-19 Cases in Bangladesh: A Descriptive Study', 2020.
2. Texila International Journal of Academic Research, 1–8. doi: 10.21522/TIJAR.2014.07.01. Art020.
3. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, Liu L, Shan H, Lei CL, Hui DS, Du B (2020) Clinical characteristics of novel coronavirus infection in China. medRxiv. https://doi.org/10.1101/2020.02.06.20020974, 2019.
4. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, Zhang L, Fan G, Xu J, Gu X, Cheng Z, Yu T, Xia J, Wei Y, Wu W, Xie X, Yin W, Li H, Liu M, Xiao Y, Gao H, Guo L, Xie J, Wang G, Jiang R, Gao Z, Jin Q, Wang J and Cao B. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet, 2020; 395: 497-506.
5. Coronavirus disease (COVID-19) pandemic, The World Health Organization (WHO), available at: https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid19#:~:text=WHO%20announced%20COVID%2D19,on%2011%20March%202020.
6. Hossain, I., Mullick, A. R., Khan, M. H., Ahmad, S. A., Rahman, S. and Aktaruzzaman, M. 'Epidemiology of Coronavirus Disease: Past, Present, Future Prospects and Its Journey Towards Bangladesh', International Medical Journal, 2020; 25(06): 2517–2529.
7. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, Wang B, Xiang H, Cheng Z, Xiong Y, Zhao Y Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. JAMA. https://doi.org/10.1001/jama.2020.1585, 2020.
8. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, Qiu Y, Wang J, Liu Y, Wei Y, Yu T Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet, 2020; 395: 507–513.
9. Walker M., High Mortality Rate in Intubated COVID-19 Patients in NYC Medpage Today, 2020.
10. Available at: https://www.medpagetoday.com/infectiousdisease/covid19/86101.
11. Covid-19 in the UK: intensive care survival rate, access on: 20.07.2020.
12. Available at: https://www.statista.com/chart/21360/uk-intensive-care-covid-19-survival-rate/.
13. Touret F, de Lamballerie X. Of chloroquine and COVID-19. Antivir Res, 2020; 177: 104762.
14. Yao X, Ye F, ZhangM, et al. In vitro antiviral activity and projection of optimized dosing Design of Hydroxychloroquine for the treatment of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Clin Infect Dis., 2020.
15. Hossain, I., Khan, M. H., et al. 'The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China', Journal of Medical Science and clinical Research, 2020; 41(2): 145–151. doi: 10.3760/cma.j.issn.0254-6450.2020.02.003.
16. Kwon JY, Romero R, Mor G. New insights into the relationship between viral infection and pregnancy complications. Am J Reprod Immunol, 2014; 71(5): 387–390. doi: 10.1111/aji.12243.
17. Price ME, Fisher-Hoch SP, Craven RB, McCormick JB. A prospective study of maternal and fetal outcome in acute Lassa fever infection during pregnancy. BMJ., 1988; 297(6648): 584–587. doi: 10.1136/bmj.297.6648.584.
18. Jamieson DJ, Uyeki TM, Callaghan WM, Meaney-Delman D, Rasmussen SA. What obstetrician-gynecologists should know about Ebola: a perspective from the Centers for Disease Control and Prevention. Obstet Gynecol. 2014; 124(5): 1005–1010. doi: 10.1097/AOG.0000000000000533.
19. Fisk NM, Atun R. Systematic analysis of research underfunding in maternal and perinatal health. BJOG, 2009; 116(3): 347–356. doi: 10.1111/j.1471-0528.2008.02027.
20. Field SK, Bell SG, Cenaiko DF, Whitelaw WA (1991) Relationship between inspiratory effort and breathlessness in pregnancy. J Appl Physiol, 1985; 71(5): 1897–1902.
21. Toppozada H, Michaels L, Toppozada M, El-Ghazzawi I, Talaat M, Elwany S. The human respiratory nasal mucosa in pregnancy. An electron microscopic and histochemical study. J Laryngol Otol., 1982; 96(7): 613–626. doi: 10.1017/S0022215100092902.
22. Bende M, Gredmark T. Nasal stuffiness during pregnancy. LARYNGOSCOPE, 1999; 109(7 Pt 1): 1108–1110. doi: 10.1097/00005537-199907000-00018.
23. Kourtis AP, Read JS, Jamieson DJ. Pregnancy and infection. N Engl J Med, 2014; 370(23): 2211–2218. doi: 10.1056/NEJMra1213566.
24. Pieper PG, Hoendermis ES. Pregnancy in women with pulmonary hypertension. NETH HEART J., 2011; 19(12): 504–508. doi: 10.1007/s12471-011-0219-9.
25. Nelson DM, Main E, Crafford W, Ahumada GG. Peripartum heart failure due to primary pulmonary hypertension. OBSTET GYNECOL, 1983; 62(3 Suppl): 58s–63s.
26. Mor G, Cardenas I. The immune system in pregnancy: a unique complexity. Am J Reprod

Immunol, 2010; 63(6): 425–433. doi: 10.1111/j.1600-0897.2010.00836.
27. Silasi M, Cardenas I, Kwon JY, Racicot K, Aldo P, Mor G. Viral infections during pregnancy. Am J Reprod Immunol, 2015; 73(3): 199–213. doi: 10.1111/aji.12355.
28. Docherty, A. B., Harrison, E. M., Green, C. A., Hardwick, H. E., Pius, R., Norman, L., Holden, K. A., Read, J. M., Dondelinger, F., Carson, G., Merson, L., Lee, J., Plotkin, D., Sigfrid, L., Halpin, S., Jackson, C., Gamble, C., Horby, P. W., Nguyen-Van-Tam, J. S., M. G. Features of 20 133 UK patients in hospital with covid-19 using the ISARIC WHO Clinical Characterisation Protocol: Prospective observational cohort study. The BMJ, 369. https://doi.org/10.1136/bmj.m1985, 2020.
29. Fei Zhou Clinical Course and Risk Factors for Mortality of Adult in Patients with COVID-19 in Wuhan, China: A Retrospective Cohort Study. J Med Stud Res., 2020; 3: 015.
30. Kourtis AP, Read JS, Jamieson DJ. Pregnancy and infection. N Engl J Med, 2014; 370: 2211–8.
31. Lam CM, Wong SF, Leung TN, et al. A case-controlled study comparing clinical course and outcomes of pregnant and non-pregnant women with severe acute respiratory syndrome. BJOG, 2004; 111: 771–4.
32. Yang H, Wang C, Poon LC. Novel coronavirus infection and pregnancy. Ultrasound Obstet Gynecol, 2020; 55: 435–7.
33. Jamieson DJ, Theiler RN, Rasmussen SA. Emerging infections and pregnancy. Emerg Infect Dis., 2006; 12: 1638–43.
34. Juusela A, Nazir M, Gimovsky M, et al. Two cases of coronavirus 2019–related cardiomyopathy in pregnancy. Am J Obstet Gynecol MFM, 2020; 2: 100113.
35. Creanga AA, Kamimoto L, Newsome K, et al. Seasonal and 2009 pandemic influenza A (H1N1) virus infection during pregnancy: a population-based study of hospitalized cases. Am J Obstet Gynecol, 2011; 204(1): S38-S45.