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A Study On Covid Positive Anaemic Pregnant Women At A Tertiary Care Centre.

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ABSTRACT

Anemia is a very common occurrence during pregnancy, with important variations during each trimester. Anemia was also considered as a risk factor for severity and negative outcomes in patients with SARS-CoV-2 infection. As the COVID-19 pandemic poses a significant threat for pregnant women in terms of infection risk and access to care. To correlating the lab parameter including blood sugar in these COVID infected anemic pregnant women with those with COVID-19 infected pregnant women with normal Hemoglobin levels. The Observational study done on pregnant females in labour and post-delivery patients who were diagnosed with COVID-19 infection using the SARS COV-2 nasopharyngeal reverse transcriptase polymerase chain reaction (RT-PCR) from 1st April 2020 to 30th June 2021. The required demographic, clinical details and haemoglobin levels were obtained, and selected participants were followed up until they were discharged. In our study, out of 58 women, who had anaemia in pregnancy with COVID-19 infection delivering 59 neonates (1set of twins), 55.5% were in the age group of 25-35 years, 77% reached full term pregnancy and 67% were multigravida. 51.7 % patients were transferred from periphery hospitals. Delivery was by caesarean section in 61% and 39% delivered vaginally. 38.8% neonates delivered had birthweight of <2.5 kg out of which 20% had intrauterine growth restriction and 22.4 % were preterm. 3.4% stillbirth were reported. No maternal deaths were reported. From our study, maternal and neonatal outcome were unaffected by anaemia in COVID-19 pregnant women. Severely anaemic patients with comorbidities should be transferred to centres with appropriate neonatal intensive care facilities for delivery.

Keywords: COVID-19, COVID-19 in pregnancy, Anaemia in pregnancy, Anaemia, COVID-19 and anaemia.

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INTRODUCTION

According to the World Health Organization, more than 2 billion people worldwide suffer from iron deficiency, and more than 38% of pregnant women worldwide suffer from anemia during pregnancy [1]. Anemia affects only 20% of pregnancies in the United States due to intensive screening and empiric nutritional supplementation during pregnancy [2], but still, iron-deficiency anemia is the most frequent anemia of pregnancy and one of the most frequent complications during pregnancy in developed countries [3, 4]. Moreover, other studies researching anemia in pregnancy discovered that 42% of randomly chosen non-anemic first trimester women were iron deficient using conventional transferrin satu- ration and serum ferritin cut-off values [5]. Iron deficiency is widespread, especially in women of childbearing age, and is mostly caused by menstrual blood loss and a lack of iron-rich foods consumed orally [6]. This problem is exacerbated during pregnancy. Women need iron and folate throughout pregnancy to satisfy their own demands and those of the growing fetus. The issue is that if pregnant women become lacking in certain nutrients, they will be unable to provide themto the fetus in appropriate amounts. Iron deficiency anemia is defined by a low serum ferritin level, typically 15 μg/L. Additionally, a serum ferritin concentration of 30 μg/L suggests depleted iron reserves [7]. Fetal growth requires around 800–850 mg of iron [8]. Women who are already iron deficient and anemic throughout early pregnancy will exhaust. residual iron reserves and become more anemic. In women who are not anemic but are iron deficient, continued depletion of iron reserves may result in anemia. Even women with adequate hemoglobin and iron reserves are at risk of developing an iron deficit later in pregnancy. Iron deficiency anemia is related to an increased risk of blood transfusion, preterm birth, cesarean delivery, and neonatal critical care unit hospitalization if present at delivery [9, 10]. Low folate intake before conception raises the chance of neural tube abnormalities in the infant. Inadequate iron and folate levels in women may result in anemia, which makes women weary, dizzy, and more susceptible to infections, such as the SARS-CoV-2, during the ongoing pandemic. As such, iron supplementation is sug- gested if this problem is detected during pregnancy or after delivery, since it is related to unfavorable maternal and newborn outcomes [11]. Therefore, three possible ways to prevent and control the development of iron deficiency and iron deficiency anemia should be considered. These encompass dietary diversification, food fortification and individual oral iron supplementation, as the first line method [12]. Considering the gastrointestinal upset caused by iron supplementation, this can be administered every other day with similar efficiency [13]. The pandemic caused by SARS-CoV-2 had a dramatic influence on healthcare systems, social institutions, and the global economy [14]. The COVID-19 pandemic's detrimental impacts on maternal and perinatal health are not confined to the disease's direct morbidity and death. We expect that Romanian pregnant women who are left behind for prenatal monitoring and treatment as a result of the COVID-19 pandemic's limitations [15, 16] would have worse pregnancy outcomes, as it was recently demonstrated in a global analysis concluding that maternal and fetal outcomes have deteriorated as a result of the COVID-19 pandemic, with an increase in maternal deaths, stillbirths, and maternal depression. As growing concerns during the pandemic affect medical workers and mothers, we believe that anemia during pregnancy can be easily overlooked in these times, as much as it is still an understudied topic in correlation with COVID-19. Therefore, we aimed to identify potential unwanted outcomes of anemia during pregnancy that might be associated with maternal exposure to SARS-CoV-2 and determine the difference made by nutritional supplementation in these pregnancies.

METHODS

Observational study done on pregnant females in labour and post-delivery patients who were diagnosed with COVID-19 infection using the SARS COV-2 nasopharyngeal reverse transcriptase polymerase chain reaction (RT-PCR) from 1st April 2020 to 30th June 2021. The required demographic, clinical details and haemoglobin levels were obtained, and selected participants were followed up until they were discharged. Parameters Variables like age, parity, referred or transferred cases, duration of pregnancy, haemoglobin levels, requirement of blood transfusion, co-morbid condition, mode of delivery and fetal outcome were noted. All pregnant women were tested for COVID-19 using the RTPCR. technique. Maternal risk factors, mortality and morbidity in anaemic COVID-19 infected individuals, and foetaloutcome were the key outcome measures investigated. Selected study participants were followed up untildischarge. Patients with ectopic pregnancy and those withmultiple co-morbid conditions were excluded in the study.

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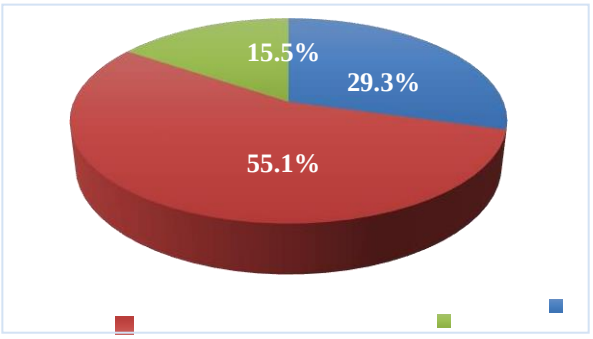
Statistical analysis

All of the factors were examined and analysed using percentages. Because this was an observational study, the maternal and neonatal parameters were determined using descriptive statistics such as percentages and proportions, and no statistical tests were used.

RESULTS

This retrospective study was conducted at a tertiary care centre on anaemic COVID-19 positive patients over a span of 15 months. 58 cases among COVID-19 positive patients had anaemia. Maximum number of study subjects were in the age range of 25-30 years which accounted for 55.1% (32 patients) followed by <25 years in 29.3% (17 patients) and 15.5% above 30 years (9patients) (Figure 1). Age wise distribution



Gestational week wise distribution of anaemic patients is shown in (Figure 2). Majority of the pregnancies reached full term gestation i.e 77.5% (45 patients) and 22.4% (13 patients) were preterm deliveries. Gravida wise distribution is depicted in (Figure 3). Majority of the subjects were multigravida 67% (39 patients) and 33%(19 patients) were primigravida. Total number of patients transferred from peripheral hospital to our hospital and patients registered in our hospital is shown in (Figure 4). 51.7% (30 patients) were transferred from other hospital. 48% (28 patients) were registered in our hospital. Distribution according to degree of anaemia is depicted in (Figure 5). Maximum patients were in the moderate anaemia group with 75.8% (44 patients) followed by mild anaemia in 17.2% (10 patients). Around 6.8% (4 patients)had severe anaemia. Patients who required blood transfusion or parenteral iron and oral iron preparations is shown in (Figure 6). All patients in mild anaemia group were managed by oral iron preparation. In patients with

Figure 2: Gravida-wise distribution.

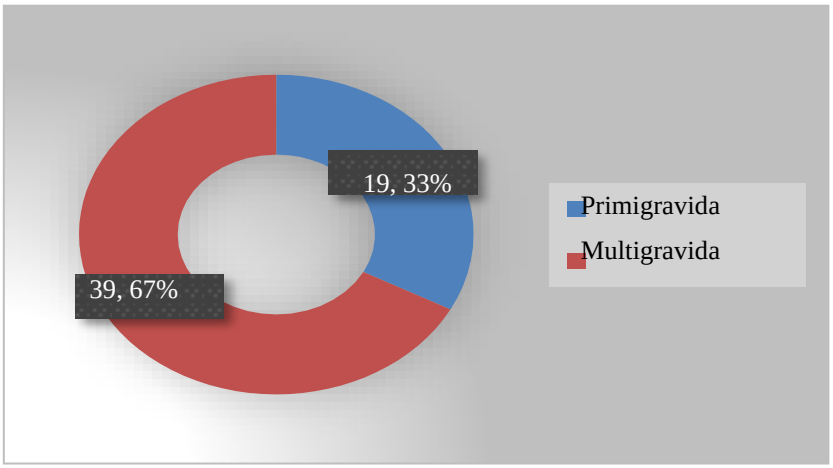


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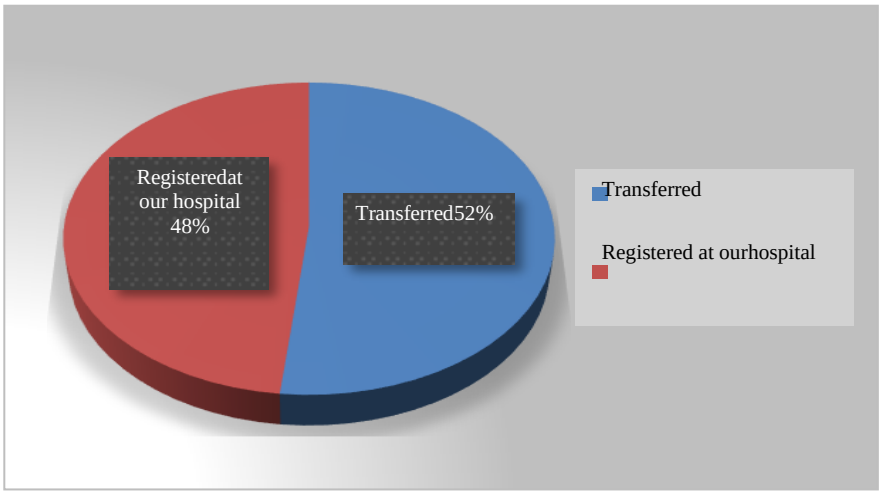
Figure 3: Transferred patient wise distribution.



Birth weight wise distribution is depicted in (Figure 7). 47% (27 neonates) were in the birth weight of 2.6 to 3 kg. 32% (19 neonates) were in the birth weight range of 2.1 to 2.5 kg. 14% (8 neonates) had birth weight more than 3 kg and 3.4% (2) had birth weight in the range of 1 to 1.5kg. 1.7% (1 neonate) had birth weight less than 1 kg and 1.7% (1 neonate) had birth weight between1.6 to 2 kg. About 38.9% (23 neonates) were low birth weight and 60.9% (36 neonates) were normal weight. 1 patient hadtwins. 3.4% patients had IUFD (2 stillborn). 20% (12 neonates) were intrauterine growth restricted. Total 61% (35) patients were delivered by lower segment caesarean section for maternal and fetal indications and 39 % (23 patients) were delivered by vaginal

Figure 4: Distribution according to degree of anaemia.

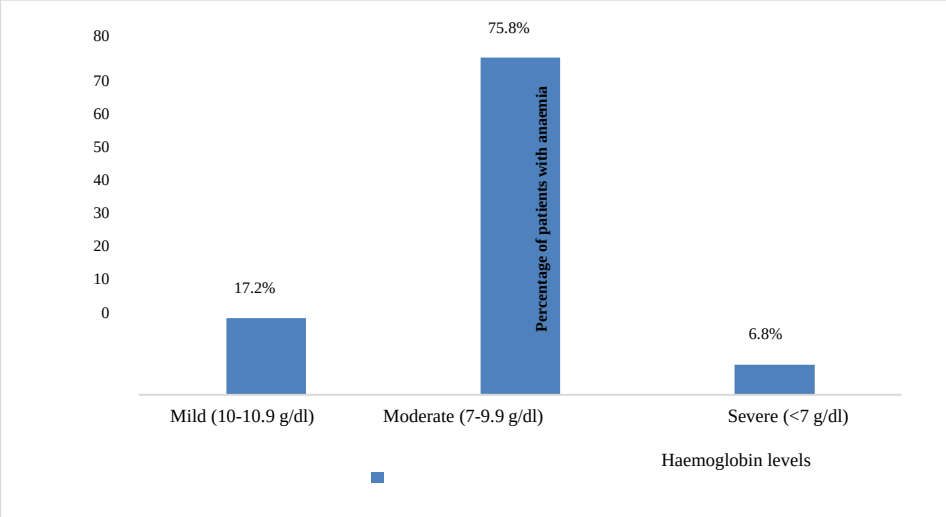


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Figure 5: Patients requiring blood transfusion, parenteral iron preparation and oral iron preparationin mild, moderate and severe anaemia.

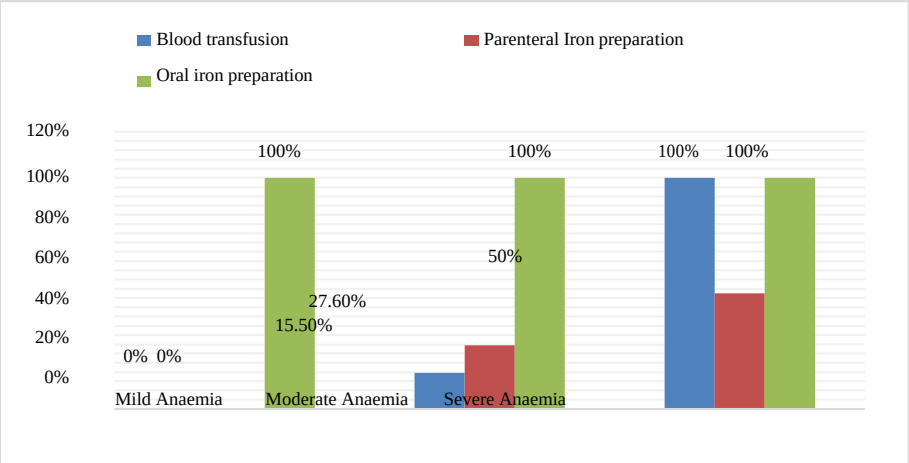
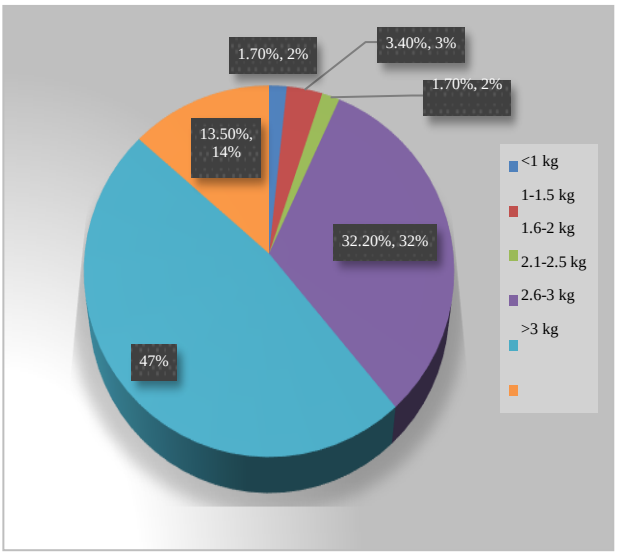


Figure 6: Birth weight-wise distribution.



DISCUSSION

According to WHO, Anemia is defined as a blood hemoglobin (Hb) concentration below 110 g/l.[8] According to data from the World Health Organization (WHO)/world health statistics, 36.5 percent of pregnant women globally had anaemia in 2019 [9]. India has a prevalence of 50% for anemia in pregnancy according to WHO, global health observatory data repository/worldhealth statistics [9].

Anemia is a common cause of maternal death in underdeveloped countries, accounting for around half of all maternal deaths, with India accounting for roughly 80% of maternal deaths in South Asia. In India, the prevalence of anaemia in pregnant women has decreased slightly from 58 % in the NFHS-3 (National family health survey-2005-06) to 50 % in the NFHS-4 survey (2015-16) [10]. Increased demand for iron for the growing foetus and placenta; and increased red blood cell mass (with expanded maternal blood volume in the third trimester) are common causes of iron deficiency anaemia during pregnancy, which is exacerbated by other factors such as childbearing at a young age, recurring pregnancies, short durations between childbirths, and lack of accessibility to maternity services and supplementation. Anemia during pregnancy is defined as a haemoglobin (Hb) level of less than 10.9 g/dl, according to the Indian council of medical research [11]. During the course of COVID-19 infection, iron metabolism is known to be disrupted. Anemia may occur as a result of iron-restricted erythropoiesis caused by changes in iron metabolism. In the course of the disease, ferritin acts as an acute phase

reactant, reducing iron availability [12, 13]. In our study of 58 women, who had anaemia in pregnancy with COVID-19 infection delivering 59 neonates (1 set of twins), 55.5% were in the age group of 25-35 years, 77% reached full term pregnancy and 67% were multigravida. As our hospital caters to largest slum population in India and is at the crossroads of eastern and western express highway, our hospital gets maximum number of referrals from other periphery hospitals. 51.7% patients were transferred from periphery hospitals. 75.8% patients were in the moderate anemia group. All patients in mild anaemia group were managed by oral iron No study has been done in anaemia in pregnancy in COVID-19 as of now. According to a study done on anaemia in COVID-19 hospitalized patients by Rajanna et al severe anaemia attributed to a worse prognosis in the form of higher mortality in COVID-19 patients [14]. Taneri et al showed that haemoglobin levels were considerably lower in individuals with severe COVID-19 compared to mild to moderate instances in a meta-analysis [15]. This study was done on general population. More studies need to be done on anaemia in pregnancy in COVID-19 patients. In our study, no evidence of increased mortality and morbidity and adverse foetal outcome related to COVID-19 infection was found. All our patients were asymptomatic and were incidentally detected to be COVID-19 positive by RTPCR done on admission to hospital.

CONCLUSION

As most of our patients were asymptomatic mild cases of COVID-19, maternal and neonatal outcome were unaffected by COVID-19 infections. Intra-uterine growth restriction was noted in neonates and is a consequence of anaemia itself. Further studies are needed to prove association of anaemia and COVID-19 causing maternal and fetal adverse effects. All pregnant women must be closely monitored during booking maternity visits, and their haemoglobin levels must be raised optimally before delivery. Severely anaemic patients with comorbidities should be transferred to higher centres with appropriate blood bank & neonatal intensive care facilities for delivery.

REFERENCES

[1] Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. China Novel Coronavirus Investigating and Research Team. A Novel Coronavirus from Patients with Pneumonia in China. N Engl J Med 2019 2020;382(8):727-33.

[2] Hamming I, Timens W, Bulthuis ML, Lely AT, Navis G, Goor H. Tissue distribution of ACE2 protein, the functional receptor for SARS coronavirus: a first step in understanding SARS pathogenesis. J Pathol 2004;203:631-7.

[3] Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet 2020;6736(20):30211-7.

[4] Mackenzie JS, Smith DW. COVID-19: a novel zoonotic disease caused by a coronavirus from China: what we know and what we don't. Microbiol Aust 2020.

[5] Kerala Defeats Coronavirus; India's Three COVID19 Patients Successfully Recover. Availableat: https://www.thenewsminute.com/article/india-s- three-coronavirus-patients-recover-kerala-fm-lauds- health-dept-s-efforts-118163.Accessed on 20November 2022.

[6] WHO Director-General's opening remarks at the media briefing on COVID-19.Available at:https://www.who.int/dg/speeches/detail/who- director-general-s-opening-remarks-at-the-media- briefing-on-covid-19-11-march-2020. Accessed on20 November 2021.

[7] Dhont S, Derom E, Van Braeckel E, Depuydt P and Lambrecht BN. The pathophysiology of 'happy' hypoxemia in COVID-19. Respir Res 2020;21(1): 198.

[8] Pavord S, Daru J, Prasannan N, Robinson S, Stanworth S, Girling J. UK guidelines on the management of iron deficiency in pregnancy. Br J Haematol 2020;188:819-30.

[9] Global Health Observatory Data Repository/World Health Statistics. Available at: https://www.who.int/ data/gho. Accessed on 20 November 2022.

[10] National family health survey 2015-16 (NFHS-4).Available at: rchiips.org/NFHS/pdf/NFHS4/India. pdf. Accessed on 20 November 2022.

[11] Anemia. Available at: https://www.nhp.gov.in/ disease/gynaecology-and-obstetrics/anaemia-during- pregnancy-maternal-anemia. Accessed on 20 November 2022.

[12] Taneri PE, Gómez-Ochoa SA, Llanaj E. Anemia and iron metabolism in COVID-19:a systematic review and meta-analysis. Eur J Epidemiol 2020;35(8):763-73.

[13] Henry BM, de Oliveira MHS, Benoit S, et al. Hematologic, biochemical and immune biomarker

abnormalities associated with severe illness and mortality in coronavirus disease 2019 (COVID-19): a meta-analysis. Clin Chem Lab Med 2020;58(7):1021-8.

[14] Faghih Dinevari M, Somi MH, Sadeghi Majd E, Abbasalizad Farhangi M, Nikniaz Z. Anemia predicts poor outcomes of COVID-19 in hospitalized patients: a prospective study in Iran. BMC Infect Dis 2021;21(1):170.

[15] Stewart T, Lambourne J, Thorp-Jones D, Thomas D. Implementation of early management of iron deficiency in pregnancy during the SARS-CoV-2 pandemic. Eur. J. Obstet. Gynecol. Reprod. Biol 2020;258:60–62

[16] Vandermeulen H, Strauss R, Lin Y, McLeod A, Barrett J, Sholzberg M, Callum J. The contribution of iron deficiency to the risk of peripartum transfusion: A retrospective case control study. BMC Pregnancy Childbirth.