7 true-positive cases of PASD contemplating uterine preservation, three (43%) required hysterectomy.

Cases 16 and 20 had complete placental separation at delivery. Postpartum hemorrhage necessitated re-laparotomy and hysterectomy and subsequent histology provided a confirmed diagnosis of PASD.

The present study supports screening cases with cesarean scar for PASD in routine clinical settings.[3] Consistent with previous findings, placental location is more indicative than sonographic features of PASD.[4] False-positive cases are not overtreated as bleeding risks remain high. PASD can still occur in cases where a normally located placenta separates fully.

CONFLICT OF INTEREST

The authors have no conflicts of interest.

AUTHOR CONTRIBUTIONS

TKL conceived the study, analyzed and interpreted the data, and wrote and revised the manuscript. SLM, CHS, and LFC drafted the protocol, collected the data, and revised the manuscript. All authors approved of the final version of the manuscript.

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Obstetrics

Clinical presentations, pregnancy complications, and maternal outcomes in pregnant women with COVID-19 and tuberculosis: A retrospective cohort study

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To date, a large number of pregnant women have been infected with Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2) and these patients are at higher risk of developing certain pregnancy complications.[1] Out of 10 million people infected globally with tuberculosis (TB), a quarter of the disease burden is contributed by India.[2] Pregnant and postpartum women are at increased risk of developing TB, and this is associated with poor outcomes including

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TABLE 1 Details of six pregnant women with COVID-19 and active PTB

Case no.	Age (years)	Gravidity/ parity	Gestational age (week)	Clinical presentation	CXR changes/USG findings	HRCT finding	Auscultation results	Duration of ATT	Pregnancy outcomes	Lowest oxygen saturation	ARDS	Oxygen support	Treatment given
1.	26	G3P1	11	Fever, cough	CXR: left lower lobe consolidation USG: mild right-sided pleural effusion	ND	Left-sided crepitation	Newly started	Ongoing pregnancy	94%	No	No	Antibiotics, HCQ
2.	28	G4P2	11	Breathing difficulties	Bilateral heterogeneous opacities	Bilateral consolidation with cavitation. Features atypical of COVID-19 pneumonia. More likely superadded infection	Bilateral crepitation	Newly started	Early fetal demise at 11 weeks of gestation	80%	Yes	HFNO	Antibiotics, corticosteroids
3.	29	G1	26	Fever, cough	Patchy shadows and pleural effusion. Inhomogeneous shadows and fibro-calcific densities s/o old infective etiology	ND	Normal	Newly started on AKT-4 for MDR TB	Ongoing pregnancy	98%	No	No	Antibiotics
4.	34	G4P3	33	Cough, breathing difficulties	Patchy opacities in both lungs. Consolidation. Bilateral fibrotic strands. s/o old infective etiology. Widening of upper mediastinum (enlarged lymph nodes)	ND	Bilateral crepitation	Started on ATT for XDR TB four months prior to COVID-19 infection	Maternal death, pre-eclampsia FGR and oligohydramnios	60%	Yes	Mechanical ventilation	Antibiotics, low molecular weight heparin, labetalol
5.	24	G1	38	Asymptomatic	Normal	ND	Normal	ATT for 4 months	Oligohydramnios, emergency LSCS, surgical site infection, prolonged hospital stay	98%	No	No	Antibiotics
6.	24	G4P2	39	Asymptomatic	Normal	ND	Normal	ATT for 5 months	Vaginal delivery at term, induction of labor	99%	No	No	Antibiotics

Abbreviations: ARDS, acute respiratory distress syndrome; ATT, anti-TB treatment; COVID-19, coronavirus disease19; CXR, chest X-ray; FGR, fetal growth restriction; G, Gravida; HCQ, hydroxychloroquine; HFNO, high frequency nasal oxygen; HRCT, high-resolution computed tomography; LSCS, lower segment cesarean section; MDR, multi-drug-resistant; MTB, mycobacterium TB; ND, not done; P, Parity; PTB, pulmonary tuberculosis; SARS-CoV-2, Severe Acute Respiratory Syndrome Corona virus 2; S/O, suggestive of; TB, Tuberculosis; USG, ultrasonography; XDR, extensively drug-resistant.

premature birth, intrauterine growth retardation, and an increase in maternal mortality.

Tuberculosis and coronavirus disease 19 (COVID-19) primarily involve the lungs, share common risk factors, and present with similar symptoms. Increased susceptibility to SARS-CoV-2 infection has been observed in individuals with latent or active TB.[3] However, at present there is a lack of information on TB with concurrent COVID-19 in pregnant woman. The present study aims to assess the clinical presentations and maternal outcomes in pregnant and/or postpartum women with active pulmonary TB (PTB) and/or previous TB with concurrent COVID-19.

A total of 879 pregnant and/or postpartum women with COVID-19 were admitted to BYL Nair Hospital[4] from April to September, 2020. Six pregnant women were diagnosed with concurrent PTB and COVID-19. Eleven pregnant women and one postpartum woman had previous history of TB, which was subsequently cured. Ethical approval for the present study was granted by the Institutional Ethics Committee of BYL Nair Hospital (ECARP/2020/63 dated May 27, 2020) and ICMR-NIRRH (D/ICEC/Sci-53/55/2020 dated June 4, 2020). A waiver of consent was granted as the study involved retrospective data collection from medical case records.

The study demonstrates the adverse impact of TB and COVID-19 in pregnant women. Of the six women with PTB, three were recently diagnosed with PTB and were on a course of anti-tubercular treatment, while the other three patients were serendipitously diagnosed with TB while being investigated for COVID-19-related symptoms (Table 1). Since TB has an insidious onset, it is likely that TB already existed in these patients and SARS-CoV-2 infection subsequently aggravated the condition, thus leading to a severe presentation. The diagnosis of TB could have otherwise been delayed if these women had not been evaluated for COVID-19. Oxygen saturation at the time of admission in patients with active PTB and COVID-19 was comparatively lower than patients with previous TB and COVID-19 ($p = 0.04$). The clinical presentation was mild in women with past TB and COVID-19. Of the six women with PTB, there was one case of maternal mortality and one spontaneous abortion (early fetal demise at 11 weeks of gestation) observed. Additionally, 4 (67%) patients with PTB and SARS-CoV-2 co-infection were symptomatic, whereas only 2 (17%) patients with past TB and COVID-19 were symptomatic. Two women with active PTB and COVID-19 developed ARDS and required ICU admission (Table S1). One woman with extensively drug-resistant TB, who underwent treatment therapy for 4 months, developed severe complications including ARDS, preeclampsia, and fetal growth restriction, and she died 18 days after COVID-19 diagnosis. These results suggest that the combination of PTB and SARS-CoV-2 infection would possibly result in severe presentation with adverse outcomes in pregnant women.

In India, Bacillus Calmette–Guérin (BCG) vaccination is part of the country's Universal Immunization Programme, with BCG vaccinations being administered at birth. Although controversial, the BCG vaccine has been proposed as a potential method for protection against SARS-CoV-2. However, our series, similar to other epidemiological studies,[5,6] does not support this notion as all 18 patients in our study had either active TB or past exposure to TB in spite of receiving the BCG vaccine at birth and were infected with SARS-CoV-2. Co-infections are likely to be a greater challenge in low- and middle-income countries with a high burden of both diseases. A 26% decline in reported cases of TB within the national surveillance system was reported due to the COVID-19 pandemic, which has adversely affected the National Tuberculosis Elimination Program in India.[2] The present study highlights the opportunities for integration of healthcare services for the treatment of TB and COVID-19. Therefore, based on the results of our study, we recommend that pregnant women with respiratory symptoms should be tested for both COVID-19 and TB in countries with a high burden of TB. Additionally, this represents an opportunity to engage the infrastructure and trained manpower of the TB Program for the control of COVID-19, and vice versa.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest.

AUTHOR CONTRIBUTIONS

RG and NM were responsible for the study concept and design. SB, GP, NK, and AB contributed to the acquisition of data. All authors contributed to analysis and/or interpretation of data. RG, NM, and NK were responsible for the drafting of the manuscript. RG, NM, SM, DM contributed to critical revision of the manuscript for important intellectual content. RG, NM, and AB were responsible for statistical analysis. SM, RG, and NM were responsible for administrative and technical or material support.

TRIAL REGISTRATION

PregCovid study is registered with Clinical Trial Registry of India (Registration no: CTRI/2020/05/025423).

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Obstetrics

Minimally invasive management of pyoperitoneum in a COVID-19 patient: A therapeutic dilemma

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Keywords: COVID-19, mortality, near miss, percutaneous drainage, puerperal sepsis, pyoperitoneum

Pyoperitoneum and puerperal sepsis are life-threatening complications of cesarean delivery. The present study reports minimally invasive management of puerperal sepsis, pyoperitoneum and acute peritonitis in a COVID-19-positive patient.

A 25-year-old female developed fever with chills and progressively increasing abdominal pain three days after undergoing cesarean section, followed by vomiting and diarrhea. The patient was diagnosed with COVID-19 infection on postoperative day 7 and referred to our center for further management. Informed written consent was obtained from the patient for this study.

The patient was febrile, pulse rate was 120 bpm, BP 96/60 mm Hg, respiratory rate was 30 breaths per minute, and oxygen saturation was 92% on room air. Sub-involution and tenderness of the uterus was observed. A large (20 × 15 cm) abdomino-pelvic cystic mass occupied the right hypochondrium, lumbar, umbilical, and suprapubic regions. The overlying skin was erythematous, tender, with rebound tenderness suggestive of peritonitis. Chest X-ray revealed the typical signs of COVID-19 infection (Figure 1a). Serum procalcitonin was 36.2 ng/mL. Contrast enhanced computerized tomography (CECT) scanning of the abdomen and pelvis was suggestive of multiple loculated, peripherally enhancing intraperitoneal fluid collections (Figure 1b).

The patient was managed on oxygen by nasal prongs, intravenous meropenem, clindamycin, dexamethasone, and low molecular weight heparin in the intensive care unit. Two 14F pigtail catheters were inserted under CT guidance in the right and left lower abdomen using Seldinger's technique (Figure 1c–f). Two liters of purulent fluid were drained. The patient's condition significantly improved over the next 48 hours. A 5 × 6 cm supraumbilical collection persisted after one week. Considering the clinical improvement, the decision to insert a third 14F pigtail catheter was taken. The patient was discharged after 15 days of admission.

Percutaneous drainage is an established modality for management of intra-abdominal and intra-pelvic collections.[1] This minimally invasive, lifesaving approach can obviate major surgery. Contraindications for percutaneous catheter drainage are few, namely coagulopathy, absence of a safe tract, close proximity to bowel/large vessels, and signs of acute peritonitis.[2]

Considering the multiple localized fluid pockets with only narrow intercommunications and, most importantly, signs of peritonitis we initially planned to perform a laparotomy. However, considering the severity of COVID-19 infection with compromised lungs, we expected significant post-operative respiratory morbidity. This posed a significant therapeutic dilemma in planning for patient management.