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Maternal and Perinatal Outcomes in Pregnant Women with Inflammatory Bowel Disease at a Tertiary Care Centre.

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Abstract

Background: Inflammatory bowel disease (IBD), comprising Crohn's disease and ulcerative colitis, commonly affects women during their reproductive years and poses significant challenges in pregnancy. Active disease has been associated with adverse maternal and neonatal outcomes, whereas maintenance of disease remission and continuation of appropriate therapy are known to improve pregnancy outcomes. However, data on pregnancy outcomes among women with IBD remain limited in many clinical settings.

Objectives: To evaluate the demographic and clinical characteristics, disease profile, treatment patterns, maternal and obstetric outcomes, and perinatal and neonatal outcomes among pregnant women with inflammatory bowel disease managed at a tertiary care center.

Methods: A prospective observational study was conducted among 100 pregnant women with inflammatory bowel disease attending a tertiary care center. Demographic characteristics, disease type, disease activity, treatment during pregnancy, maternal complications, mode of delivery, and neonatal outcomes were recorded using a structured proforma. Data were analyzed using descriptive statistics and expressed as mean ± standard deviation for continuous variables and frequency with percentage for categorical variables.

Results: The mean maternal age was 29.8 ± 4.6 years, and ulcerative colitis constituted 58% of cases. At conception, 82% of women were in clinical remission,

while 24% experienced disease flares during pregnancy. The most commonly prescribed medication was 5-aminosalicylic acid (67%), followed by biologics (31%). Anaemia during pregnancy was the most frequent maternal complication (31%), followed by preterm labour (13%), gestational diabetes mellitus (8%), and gestational hypertension (7%). Vaginal delivery occurred in 52%, while 42% underwent caesarean section. Live birth was achieved in 94% of pregnancies, with a mean gestational age at delivery of 38.1 ± 1.9 weeks and mean birth weight of 2.97 ± 0.49 kg. Preterm birth occurred in 13%, low birth weight in 15%, and congenital anomalies in 3% of neonates. Neonatal intensive care unit admission was required in 11% of newborns.

Conclusion: Pregnancy outcomes among women with inflammatory bowel disease were generally favorable when conception occurred during disease remission and maintenance therapy was continued. Multidisciplinary management, regular disease monitoring, and adherence to recommended treatment contributed to satisfactory maternal and neonatal outcomes. These findings support current recommendations advocating continued medical therapy and coordinated obstetric–gastroenterology care to optimize pregnancy outcomes in women with IBD.

Keywords: Inflammatory Bowel Disease, Crohn's Disease, Ulcerative Colitis, Pregnancy, Maternal Outcomes, Neonatal Outcomes, Disease Activity, Bio Logic Therapy.

Introduction

Inflammatory bowel disease (IBD), comprising Crohn's disease (CD) and ulcerative colitis (UC), is a chronic relapsing inflammatory disorder of the gastrointestinal tract that predominantly affects individuals during their reproductive years. Consequently, a substantial proportion of women with IBD conceive after the diagnosis of their disease, making pregnancy management an important aspect of comprehensive IBD care. Pregnancy in women with IBD presents unique clinical challenges because both disease activity and its treatment may influence maternal, obstetric, and neonatal outcomes. Historically, concerns regarding adverse fetal effects have resulted in poor medication adherence and voluntary discontinuation of therapy during pregnancy, often predisposing women to disease relapse and subsequent pregnancy complications. [2–4]

Current evidence consistently demonstrates that disease activity at conception and during pregnancy is the principal determinant of pregnancy outcome, rather than exposure to most maintenance medications. Women who conceive during clinical remission generally have pregnancy outcomes comparable to those of the general obstetric population, whereas active disease has been associated with increased risks of miscarriage, preterm birth, low birth weight, small-for-gestational-age infants, preeclampsia, and caesarean delivery.[2,5,6] Recent studies have also shown that objective evidence of intestinal inflammation during pregnancy is independently associated with adverse maternal and neonatal outcomes, emphasizing the importance of close disease monitoring throughout gestation.[7]

Advances in medical therapy have substantially improved disease control and pregnancy outcomes in women with IBD. Large prospective registries and nationwide cohort studies have demonstrated the safety of continuing 5-amino salicylic acid (5-ASA), thiopurines, anti-tumor necrosis factor (anti-TNF) agents, vedolizumab, and ustekinumab during pregnancy, with no significant increase in congenital anomalies, neonatal infections, or adverse perinatal

outcomes compared with unexposed pregnancies.[3,8–10] Accordingly, international guidelines recommend continuation of effective maintenance therapy during pregnancy to prevent disease relapse and optimize maternal and fetal outcomes.

Furthermore, multidisciplinary care involving gastro enterologists, obstetricians, maternal–fetal medicine specialists, dietitians, and colorectal surgeons has been associated with improved disease surveillance, enhanced treatment adherence, and favorable pregnancy out comes.[2,5,11] Despite these advances, data from different geographical regions remain limited, particularly regarding maternal and neonatal outcomes in routine clinical practice.

Therefore, the present study was undertaken to evaluate the demographic profile, disease characteristics, treat ment patterns, maternal complications, and perinatal outcomes among pregnant women with inflammatory bowel disease managed at a tertiary care center.

Material and Methods

This hospital-based observational cohort study was conducted in the Departments of Gastroenterology, Obstetrics, and Gynaecology at Raichur institute of medical science. The study included pregnant women with a confirmed diagnosis of inflammatory bowel disease (IBD) who received antenatal care and delivered at the study centre during the study period Jan 2021-June 2026. The study methodology was designed in accordance with previously published observational cohort studies evaluating maternal and perinatal outcomes among women with IBD managed at tertiary referral centres.

Pregnant women aged 18 years or older with a confirmed diagnosis of Crohn's disease, ulcerative colitis, or inflammatory bowel disease-unclassified (IBD-U), established using standard clinical, endoscopic, radiological, and Histopathological criteria, were considered eligible for inclusion. Consecutive women with singleton pregnancies who completed their pregnancy at the study centre during the study period were enrolled. Women with multiple pregnancies, chronic gastrointestinal disorders other than IBD, incomplete clinical records, or loss to follow-up before documentation of pregnancy outcomes were excluded from the study.

The sample size was estimated using the prevalence of caesarean delivery among pregnant women with inflammatory bowel disease reported by Biron et al., who observed a caesarean section rate of 34.8% in women managed at a tertiary referral centre. The sample size was calculated using the single population proportion formula, $n = Z^2p\ (1 - p)/d^2$, where Z represented the standard normal deviate at a 95% confidence interval (1.96), p was the expected prevalence (34.8%), $q = 1 - p$ (65.2%), and d was the allowable absolute precision of 10%. The minimum calculated sample size was 88 participants. After accounting for approximately 10% incomplete records or loss to follow-up, the final sample size was estimated at 97 participants and was rounded to 100 pregnant women with inflammatory bowel disease.

Clinical, demographic, obstetric, and disease-related data were collected using a structured data collection proforma from hospital electronic medical records and patient case files. The variables recorded included maternal age, body mass index, gravidity, parity, duration of disease, type of IBD (Crohn's disease, ulcerative colitis, or IBD-U), disease extent and phenotype according to the Montreal classification where available, disease activity at conception and

throughout pregnancy, previous IBD-related surgery, smoking status, associated co morbidities, and medication exposure during pregnancy, including 5-aminosalicylic acid, corticosteroids, thiopurines, anti-tumour necrosis factor agents, vedolizumab, and us tekinumab. Maternal outcomes assessed included disease flare during pregnancy, gestational diabetes mellitus, gestational hypertension, preeclampsia, mode of delivery, caesarean section, postpartum haemorrhage, postpartum infections, hospitalization, and the requirement for surgical intervention. Perinatal outcomes included gestational age at delivery, preterm birth (<37 weeks of gestation), birth weight, low birth weight (<2500 g), small-for-gestational-age infants, Apgar score, neonatal intensive care unit admission, congenital anomalies, stillbirth, and neonatal mortality.

The primary outcome of the study was to evaluate maternal and perinatal outcomes among pregnant women with inflammatory bowel disease managed at a tertiary care centre. Secondary outcomes included assessment of the association between disease activity during pregnancy and adverse maternal and neonatal outcomes, evaluation of the impact of IBD medications on pregnancy outcomes, and comparison of maternal and neonatal outcomes between women with Crohn's disease and those with ulcerative colitis.

All data were entered into Microsoft Excel and analysed using IBM SPSS Statistics version 22. Continuous variables were tested for normality and expressed as mean ± standard deviation or median with interquartile range, as appropriate. Categorical variables were presented as frequencies and percentages. The study was conducted after obtaining approval from the Institutional Ethics Committee. All procedures adhered to the ethical principles outlined in the Declaration of Helsinki. Written informed consent was obtained from all participants before enrolment in prospective cases. Patient confidentiality and anonymity were maintained throughout the study by assigning unique study identification numbers and removing all personal identifiers before data analysis.

Results

A total of 100 pregnant women with inflammatory bowel disease (IBD) were included in the study. The mean maternal age was 29.8 ± 4.6 years, with the largest proportion of women belonging to the 26–30 years age group (43%), followed by those aged >30 years (35%) and ≤25 years (22%). There were 46 (46%) Primigravida and 54 (54%) multi gravida women, while 48% were null iparous and 52% were multi parous.

The mean body mass index (BMI) at booking was 22.7 ± 3.4 kg/m², and the mean gestational age at the first antenatal visit was 10.9 ± 3.2 weeks. Ulcerative colitis was the predominant diagnosis, accounting for 58% of cases, whereas 42% had Crohn's disease. The mean duration of disease was 5.4 ± 3.1 years. Previous bowel surgery had been performed in 14% of women, and 18% had a history of adverse obstetric outcomes. Anaemia at booking was present in 27%, while 16% had other coexisting medical conditions (Table 1).

At conception, the majority of women (82%) were in clinical remission, whereas 18% had active disease. During pregnancy, 24% experienced at least one disease flare. Disease activity was mild in 13%, moderate in 8%, and severe in 3% of participants. Hospitalization for an IBD flare was required in 9% of cases.

Regarding medical therapy, 5-aminosalicylic acid (5-ASA) was the most frequently prescribed medication (67%), followed by biologic therapy (31%), thiopurines (20%), and corticosteroids (18%). Combination therapy

was administered to 17% of women, while 9% discontinued medication during pregnancy. Nutritional supplementation was provided to 86% of participants, and 95% received regular gastroenterology follow-up throughout pregnancy (Table 2).

Maternal and obstetric outcomes are summarized in Table 3. Anaemia during pregnancy was the most common maternal complication, occurring in 31% of women. Disease flare requiring hospital admission was observed in 9% of participants. Gestational diabetes mellitus developed in 8%, gestational hypertension in 7%, and preeclampsia in 5%. Ante partum haemorrhage and blood transfusion were each reported in 4% of women, while postpartum haemorrhage occurred in 5%. Premature rupture of membranes was documented in 7%, and intrauterine infection occurred in 2% of pregnancies. Preterm labour was observed in 13% of women. Only one participant (1%) required intensive care unit admission, and no maternal deaths were recorded.

With respect to the mode of delivery, 52% of women had spontaneous vaginal delivery, 6% underwent instrumental vaginal delivery, and 42% delivered by caesarean section. (Table 3)

Perinatal and neonatal outcomes are presented in Table 4. Among the 100 pregnancies, 94% resulted in live births, while 5% ended in miscarriage and 1% resulted in stillbirth. The mean gestational age at delivery was 38.1 ± 1.9 weeks, and 13% of deliveries occurred before 37 completed weeks of gestation.

The mean neonatal birth weight was 2.97 ± 0.49 kg. Low birth weight was observed in 15% of neonates, whereas 10% were small for gestational age and 4% were large for gestational age. The mean APGAR scores were 8.1 ± 0.8 at 1 minute and 9.2 ± 0.5 at 5 minutes.

Overall, 11% of newborns required admission to the neonatal intensive care unit. Congenital anomalies were identified in 3% of neonates, neonatal sepsis occurred in 2%, and there was one neonatal death (1%) during the study period. (Table 4)

Table 1: Demographic and Clinical Characteristics of Pregnant Women with Inflammatory Bowel Disease (n=100)

Variable	n (%) / Mean ± SD
Total study participants	100
Age (years)	29.8 ± 4.6
≤25 years	22 (22%)
26–30 years	43 (43%)
>30 years	35 (35%)
Primigravida	46 (46%)
Multigravida	54 (54%)
Nulliparity	48 (48%)
Multiparity	52 (52%)
Body Mass Index (kg/m²)	22.7 ± 3.4
Gestational age at booking (weeks)	10.9 ± 3.2
Ulcerative colitis	58 (58%)
Crohn's disease	42 (42%)

Duration of disease (years)	5.4 ± 3.1
Previous bowel surgery	14 (14%)
Previous adverse obstetric history	18 (18%)
Anaemia at booking	27 (27%)
Other co morbidities	16 (16%)

Table 2: Disease Characteristics and Treatment During Pregnancy

Variable	n (%)
Disease in remission at conception	82 (82%)
Active disease at conception	18 (18%)
Disease flare during pregnancy	24 (24%)
Mild disease activity	13 (13%)
Moderate disease activity	8 (8%)
Severe disease activity	3 (3%)
Hospitalization for IBD flare	9 (9%)
5-ASA therapy	67 (67%)
Corticosteroid therapy	18 (18%)
Thiopurine therapy	20 (20%)
Biologic therapy	31 (31%)
Combination therapy	17 (17%)
Medication discontinued during pregnancy	9 (9%)
Nutritional supplementation	86 (86%)
Gastroenterology follow-up	95 (95%)

Table 3: Maternal and Obstetric Outcomes

Maternal Outcome	n (%)
Disease flare requiring admission	9 (9%)
Anaemia during pregnancy	31 (31%)
Gestational hypertension	7 (7%)
Preeclampsia	5 (5%)
Gestational diabetes mellitus	8 (8%)
Antepartum haemorrhage	4 (4%)
Preterm labour	13 (13%)
Premature rupture of membranes	7 (7%)
Intrauterine infection	2 (2%)
Blood transfusion	4 (4%)

Postpartum haemorrhage	5 (5%)
ICU admission	1 (1%)
Maternal mortality	0
Vaginal delivery	52 (52%)
Instrumental vaginal delivery	6 (6%)
Caesarean section	42 (42%)

Table 4: Perinatal and Neonatal Outcomes

Outcome	n (%) / Mean ± SD
Miscarriage	5 (5%)
Stillbirth	1 (1%)
Live birth	94 (94%)
Gestational age at delivery (weeks)	**38.1 ± 1.9**
Preterm birth (<37 weeks)	13 (13%)
Birth weight (kg)	**2.97 ± 0.49**
Low birth weight	15 (15%)
Small for gestational age	10 (10%)
Large for gestational age	4 (4%)
APGAR 1 minute	**8.1 ± 0.8**
APGAR 5 minutes	**9.2 ± 0.5**
NICU admission	11 (11%)
Congenital anomalies	3 (3%)
Neonatal sepsis	2 (2%)
Neonatal mortality	1 (1%)

Discussion

The present study evaluated the demographic characteristics, disease profile, treatment patterns, and maternal and neonatal outcomes among pregnant women with inflammatory bowel disease (IBD). Overall, the findings indicate that most women conceived during disease remission, continued maintenance therapy throughout pregnancy, and experienced favorable maternal and neonatal outcomes. These observations are consistent with recent evidence demonstrating that pregnancy outcomes in women with IBD are largely determined by disease activity rather than the diagnosis itself, and that multidisciplinary care with continued medical therapy is associated with improved obstetric and perinatal outcomes. [1,2]

The demographic profile of the study population was comparable to that reported in contemporary IBD pregnancy cohorts. The mean maternal age of 29.8 years and the predominance of ulcerative colitis (58%) closely resemble the findings of the multidisciplinary cohort by Biron et al. and the Qatar cohort, in which ulcerative colitis constituted approximately 55–57% of cases. [1,5] The relatively low prevalence of previous bowel surgery (14%) and the mean disease duration of 5.4 years

suggest that most participants had established but clinically stable disease before conception. Anaemia at booking was observed in more than one-quarter of women, reflecting the well-recognized contribution of chronic intestinal inflammation, nutritional deficiencies, and iron depletion in pregnant women with IBD. [6]

Disease remission at conception is considered the strongest predictor of favorable pregnancy outcomes. In the present study, 82% of women conceived during clinical remission, while only 18% had active disease. These findings are comparable with those reported by Biron et al. (88% remission) and Joudah et al., who demonstrated sustained remission in the majority of pregnancies managed in dedicated multidisciplinary clinics.[1,5] Disease flare occurred in 24% of women, which is within the range reported by prospective and retrospective cohorts evaluating disease activity during pregnancy.[1,2] The relatively low hospitalization rate for disease flare (9%) further supports the effectiveness of regular gastroenterology follow-up and maintenance therapy in preventing severe disease exacerbations.

The treatment profile observed in the present study is in accordance with current international recommendations advocating continuation of maintenance therapy during pregnancy. Most women received 5-aminosalicylic acid therapy, while biologics, thiopurines, and corticosteroids were prescribed according to disease severity. Importantly, medication discontinuation occurred in only 9% of women, indicating good treatment adherence. The PIANO registry demonstrated that exposure to biologics and thiopurines during pregnancy was not associated with an increased risk of congenital anomalies, preterm birth, or neonatal infections, supporting continuation of therapy throughout gestation.[3] Similarly, nationwide Danish data confirmed the safety of maternal 5-aminosalicylic acid use during pregnancy, with no significant increase in adverse neonatal outcomes.[4] More recently, the French nationwide study by Meyer et al. further demonstrated that vedolizumab and ustekinumab were not associated with increased risks of miscarriage, stillbirth, congenital anomalies, or preterm birth compared with anti-TNF therapy, reinforcing the overall safety of biologic treatment during pregnancy.[8]

Anaemia during pregnancy (31%) was the most frequently observed maternal complication in the present study, followed by preterm labour (13%), gestational diabetes mellitus (8%), and gestational hypertension (7%). These findings are consistent with previous reports identifying anaemia as one of the commonest pregnancy-related complications in women with IBD.[6] The caesarean section rate of 42% observed in the present study falls within the range reported by recent cohort studies (35–50%).[1,5,9] Higher caesarean rates among women with IBD have been attributed to obstetric indications, previous colorectal surgery, active perianal disease, and physician preference rather than disease activity alone.[1,9] Although postpartum infectious complications were not specifically evaluated in the present study, the Danish nationwide cohort reported a higher risk of postpartum infections following both vaginal and caesarean delivery in women with IBD, emphasizing the importance of careful postpartum surveillance.[10] Notably, maternal mortality was absent and only one patient required intensive care admission, reflecting favorable maternal outcomes with contemporary multidisciplinary management.

The neonatal outcomes observed were similarly encouraging. Live birth occurred in 94% of pregnancies, while miscarriage (5%) and stillbirth (1%) remained uncommon. The preterm birth rate of 13% and mean

birth weight of 2.97 kg are comparable to those reported by Joudah et al. and the IBD-ME multicentre cohort.[5,6] Low birth weight was observed in 15% of neonates and small-for-gestational-age infants accounted for 10%, both of which are within the ranges reported in recent literature.[5,6] Importantly, congenital anomalies occurred in only 3% of neonates, supporting evidence from the PIANO registry and nationwide biologic safety studies demonstrating that maintenance therapy during pregnancy does not significantly increase the risk of fetal malformations.[3,4,8] Likewise, NICU admission was required in only 11% of newborns, while neonatal sepsis and mortality remained infrequent.

Recent advances in disease monitoring have further highlighted the importance of maintaining objective remission throughout pregnancy. Prentice et al. demonstrated that active intestinal inflammation detected by intestinal ultrasound during pregnancy independently increased the risks of prematurity, low birth weight, and preeclampsia, even when clinical disease activity appeared minimal. [7] These findings reinforce the need for close surveillance using objective disease assessment, particularly in women with clinically quiescent disease.

Overall, the findings of the present study support the growing evidence that favorable pregnancy outcomes can be achieved in women with IBD when conception occurs during disease remission, maintenance medications are continued, and multidisciplinary obstetric and gastroenterology care is provided. Continued patient education regarding medication safety, optimization of nutritional status, and regular monitoring of disease activity remain fundamental strategies for improving maternal and neonatal outcomes in this high-risk population.

Conclusion

The present study demonstrated that favorable maternal and neonatal outcomes can be achieved in pregnant women with inflammatory bowel disease when conception occurs during disease remission and appropriate multidisciplinary care is provided.

Most participants remained in remission throughout pregnancy, continued maintenance therapy, and experienced satisfactory obstetric and perinatal outcomes, with low rates of severe maternal and neonatal complications.

Anaemia and preterm labour were the most common maternal complications, while live birth rates were high and congenital anomalies were uncommon. These findings reinforce current evidence supporting the safety of continued IBD therapy during pregnancy and highlight the importance of preconception counseling, regular disease monitoring, and coordinated obstetric–gastroenterology care to optimize pregnancy outcomes.

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