Section: Obstetrics & Gynaecology

Original Research Article

VAGINAL BIRTH AFTER CAESAREAN AND REPEAT CAESAREAN DELIVERY: MATERNAL AND NEONATAL OUTCOMES IN A TERTIARY CARE HOSPITAL IN ODISHA

Purna Chandra Pradhan[1], Debasis Giri[2], Alpha Biswas[3]

[1]Assistant Professor, Department of Community Medicine, SLN Medical College & Hospital, Koraput, Odisha, India
[2]Assistant Professor, Department of Obstetrics & Gynaecology, SRM Medical College and Hospital, Bhawanipatna, Odisha, India
[3]Assistant professor, Department of Obstetrics & Gynaecology, FM Medical College and Hospital, Balasore, Odisha, India

Received : 23/02/2026
Received in revised form : 10/04/2026
Accepted : 29/04/2026

Keywords:
Vaginal birth after caesarean, trial of labour after caesarean, repeat caesarean section, maternal outcome, perinatal outcome.

Corresponding Author:
Dr. Alpha Biswas,
Email: alpha.biswas@gmail.com

DOI: 10.47009/jamp.2026.8.3.47

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2026; 8 (3); 260-265

ABSTRACT

Background: The increasing rate of caesarean section has led to a growing number of women presenting with previous caesarean deliveries in subsequent pregnancies. Vaginal birth after caesarean (VBAC) has been proposed as a strategy to reduce repeat caesarean section rates while maintaining maternal and neonatal safety. The objective is to evaluate maternal and perinatal outcomes among women with previous caesarean section and to assess the feasibility and outcomes of trial of labour after caesarean in a tertiary care setting. **Materials and Methods:** A prospective hospital-based study was conducted in the Department of Obstetrics and Gynecology at Saheed Laxman Nayak Medical College and Hospital, Koraput, Odisha. A total of 650 women with a history of previous caesarean section who fulfilled the inclusion criteria were enrolled. Clinical evaluation was performed for all participants and decisions regarding mode of delivery were made based on obstetric indications and maternal-fetal safety. Maternal characteristics, delivery outcomes, intraoperative findings, and neonatal outcomes were recorded and analyzed using descriptive statistical methods. **Result:** Among the 650 women included in the study, 420 underwent elective repeat caesarean section, while 230 were offered trial of labour after caesarean. Successful vaginal birth occurred in 150 cases, resulting in a VBAC success rate of approximately 65 percent. Adhesions and thinning of the lower uterine segment were the most common intraoperative findings in repeat caesarean deliveries. Maternal morbidity, including prolonged hospital stay and increased analgesic requirement, was higher among women undergoing caesarean section. Neonatal outcomes were largely comparable between delivery groups, although NICU admission was slightly more frequent in caesarean deliveries. The findings indicate that carefully selected women with previous caesarean section can achieve favorable outcomes with trial of labour after caesarean. Encouraging VBAC in appropriate clinical settings may reduce unnecessary repeat caesarean sections and associated maternal morbidity. **Conclusion:** Trial of labour after caesarean is a feasible and safe option in selected women when appropriate monitoring and emergency obstetric services are available. Promotion of VBAC could contribute to optimizing obstetric care and reducing the burden of repeat caesarean deliveries.

INTRODUCTION

Historically, obstetric practice followed the widely cited principle "once a caesarean, always a caesarean," which dominated clinical decision-making before the 1970s. This approach largely stemmed from concerns regarding uterine scar rupture associated with earlier classical caesarean incisions. However, with the progressive rise in global caesarean section rates, obstetricians began exploring strategies to safely reduce repeat operative deliveries. One such approach is vaginal birth after caesarean (VBAC), which has emerged as a feasible and safe option when undertaken in carefully selected women and in institutions equipped for emergency obstetric care.[1]

Caesarean section remains a major surgical intervention and should ideally be performed only

ISSN (O): 2687-5365; ISSN (P): 2753-6556

when medically justified.[2] Early obstetric literature, including the work of Cragin in 1916, reinforced the concept that a woman who had undergone a caesarean delivery should undergo repeat operative delivery in subsequent pregnancies, particularly when the earlier incision was classical.[3] Over time, with improvements in surgical techniques and the increasing use of lower segment transverse incisions, the emphasis gradually shifted toward identifying optimal management strategies for women with a prior caesarean delivery.[4]

Although caesarean section can be life-saving for both mother and fetus, it is associated with increased maternal morbidity and mortality when compared with vaginal delivery. Studies suggest that maternal mortality following caesarean delivery may be several times higher than that observed after vaginal birth.[5] Consequently, reducing unnecessary repeat caesarean sections has become a significant priority in modern obstetric care.

The most frequent indications for caesarean section include previous caesarean delivery, dystocia, fetal distress, and malpresentation.[6] Indications may be classified as absolute, such as major placenta previa or severe cephalopelvic disproportion, or relative, including conditions like failed induction, placental abruption, or certain malpresentations.[7] Monitoring patterns of caesarean section has therefore become an important component of maternal health evaluation.

To standardize the assessment of caesarean section rates across different settings, the Robson ten-group classification system was introduced and later endorsed by the World Health Organization as a global standard for comparing obstetric practices between institutions and regions.[8] This classification system allows systematic evaluation of caesarean section trends and helps identify areas where clinical practice may be optimized.

Professional bodies such as the American College of Obstetricians and Gynecologists (ACOG) have also provided guidelines for selecting women eligible for VBAC. According to these recommendations, VBAC may be considered in women with one or two previous lower segment transverse caesarean sections, an adequately assessed pelvis, absence of additional uterine scars, and the availability of facilities capable of performing emergency caesarean delivery.[9]

Several factors influence the success of VBAC and the risk of complications. The type of previous uterine incision is a critical determinant, with lower transverse incisions associated with the lowest risk of uterine rupture.[10] The indication for the previous caesarean delivery also plays an important role; non-recurrent indications such as breech presentation are associated with higher VBAC success rates.[11] Additionally, the number of prior caesarean sections influences outcomes, as women with two prior caesarean deliveries may have a higher risk of uterine rupture compared with those with a single prior procedure.[12,13]

Other factors such as the thickness of the lower uterine segment, inter-delivery interval, prior vaginal birth, fetal size, maternal body mass index, and multiple gestations may further influence the likelihood of successful VBAC.[14-19]14 –19 These factors must be carefully evaluated before offering a trial of labour after caesarean (TOLAC).

The timing and method of labour induction also require careful consideration in women with previous caesarean delivery. Professional guidelines recommend avoiding non-medically indicated deliveries before 39 completed weeks of gestation.[20] Induction methods such as prostaglandins, oxytocin augmentation, or mechanical cervical ripening have varying levels of risk and must be selected judiciously.[21,22]

Continuous monitoring during labour is essential in women undergoing trial of labour after caesarean. Clinical indicators such as fetal distress, maternal tachycardia, or hematuria may suggest scar dehiscence or rupture and require prompt intervention. Despite these concerns, VBAC offers several advantages compared with elective repeat caesarean section, including avoidance of additional uterine scars, shorter hospital stay, reduced healthcare costs, faster recovery, and earlier mother–infant bonding with improved opportunities for breastfeeding.

Given these considerations, careful evaluation of maternal and perinatal outcomes in women with previous caesarean section is essential, particularly in tertiary care settings where both trial of labour and emergency surgical care can be provided.

Aims and Objectives

1. To evaluate maternal and perinatal outcomes among women with previous caesarean section admitted to a tertiary care centre.
2. To analyze demographic characteristics, particularly maternal age distribution.
3. To assess intraoperative complications associated with repeat caesarean sections.
4. To study maternal and fetal complications occurring during trial of labour after caesarean (TOLAC).

MATERIALS AND METHODS

This prospective hospital-based observational study was conducted in the Department of Obstetrics and Gynecology at Saheed Laxman Nayak Medical College and Hospital, Koraput, Odisha. The study was carried out over a 12-month period from April 2019 to March 2020. All pregnant women with a history of previous caesarean section who were admitted either through the outpatient department or emergency services during the study period were screened for eligibility.

A total of 650 women with previous caesarean section fulfilling the predefined inclusion and exclusion criteria were included in the study. Detailed clinical evaluation and obstetric assessment

ISSN (O): 2687-5365; ISSN (P): 2753-6556

were performed for all eligible participants before determining the appropriate mode of delivery.

Inclusion Criteria

Women were included in the study if they fulfilled the following conditions:

1. Interpregnancy interval ≥18 months.
2. Multiple gestation with the first fetus in vertex presentation.
3. Gestational age ≥34 weeks at the time of admission.
4. History of lower segment caesarean section (LSCS) in the previous pregnancy.
5. Women with one or two prior LSCS.
6. Postdated pregnancy with a previous caesarean delivery.

Exclusion Criteria

Women were excluded from the study if they had any of the following:

1. Gestational age <34 weeks.
2. History of postoperative wound infection or wound dehiscence following previous LSCS.
3. History of classical caesarean section or other uterine scars, including scars from myomectomy or unknown uterine surgery.
4. Previous uterine rupture or scar dehiscence.
5. Pregnancy complicated by significant medical disorders, such as diabetes mellitus, hypertension, bronchial asthma, cardiac disease, renal disease, or seizure disorders.
6. History of complete perineal tear.
7. Presence of congenital or acquired uterine anomalies.
8. Interpregnancy interval <18 months.

All enrolled women were evaluated prospectively using a pre-designed data collection proforma developed in accordance with the objectives of the study. Clinical details including maternal age, parity, obstetric history, number of previous caesarean deliveries, and indications for previous LSCS were recorded.

Among the 650 women included in the study, the decision regarding mode of delivery was made based on clinical assessment, obstetric indications, and maternal-fetal safety.

- 420 women underwent elective repeat caesarean section without being offered a trial of labour due to obstetric or clinical considerations.
- 230 women were considered suitable candidates for trial of labour after caesarean (TOLAC).

Among those undergoing trial of labour:

- 150 women achieved successful vaginal delivery (VBAC).
- 80 women required emergency repeat caesarean section due to failed trial of labour or emerging obstetric indications.

Thus, the study population was categorized into the following groups:

Group 1: Women who underwent elective repeat caesarean section without trial of labour.

Group 2: Women who underwent trial of labour and achieved vaginal delivery (VBAC).

Group 3: Women who underwent trial of labour but required emergency repeat caesarean section due to failed TOLAC.

All study participants underwent detailed general, systemic, and obstetric examinations upon admission. Assessment included evaluation of maternal vital signs, abdominal examination, pelvic assessment where indicated, and ultrasonographic evaluation when necessary.

Women with gestational age up to 40 weeks were considered eligible for trial of labour after excluding contraindications for vaginal delivery and ensuring the absence of clinical fetopelvic disproportion.

Patients undergoing trial of labour after caesarean (TOLAC) were carefully monitored during the intrapartum period. Particular attention was paid to clinical indicators suggestive of impending uterine scar complications, including: Maternal tachycardia or hypotension, Scar tenderness, Suprapubic bulging, Vaginal bleeding, Fetal heart rate abnormalities, Hematuria.

Labour progress was monitored using a partograph, and parameters such as cervical dilatation, effacement, fetal head descent, and uterine contractions were recorded at regular intervals.

In selected cases where induction or augmentation of labour was clinically indicated, oxytocin infusion and/or intracervical prostaglandins were used cautiously, particularly in women with an unfavourable Bishop's score. Artificial rupture of membranes was performed during the active phase of labour whenever required to facilitate labour progression.

If uterine rupture or scar dehiscence was suspected, the trial of labour was immediately discontinued, and the patient was taken for emergency laparotomy with repeat caesarean section. For women undergoing repeat caesarean section, detailed intraoperative observations including the indication for surgery, intraoperative findings, and postoperative complications were documented. Maternal outcomes were assessed in terms of operative complications, postoperative morbidity, and recovery status.

Perinatal outcomes were evaluated in both vaginal and caesarean deliveries by assessing:

- APGAR score at birth
- Birth weight
- Prematurity
- Neonatal morbidity and mortality

All collected data were compiled and analyzed using appropriate descriptive and inferential statistical methods. Quantitative variables were expressed as mean ± standard deviation, while categorical variables were presented as frequency and percentage distributions. Statistical analysis was performed to evaluate maternal and perinatal outcomes among the different study groups.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

RESULTS

During the study period, a total of 1,520 caesarean deliveries were performed at Saheed Laxman Nayak Medical College and Hospital. Among all obstetric admissions, 720 women had a history of previous caesarean section. After applying the inclusion and exclusion criteria, 650 women were enrolled in the present study.

Out of these 650 cases, 420 women underwent elective repeat lower segment caesarean section (LSCS) due to obstetric indications or clinical considerations. 230 women were considered suitable for trial of labour after caesarean (TOLAC). Among those who underwent TOLAC, 150 women achieved successful vaginal birth after caesarean (VBAC), while 80 women required emergency repeat caesarean section due to failed trial of labour or intrapartum complications. Thus, the overall VBAC success rate in the present study was 65.2 percent.

Table 1: Age distribution of study participants (n = 650)

S. No	Age group (years)	Cases	Percentage
1	≤19	4	0.6
2	20–24	240	36.9
3	25–29	320	49.2
4	30–34	76	11.7
5	≥35	10	1.6

The majority of women in the study population belonged to the 20–29 year age group, accounting for approximately 86 percent of cases. Women above 35 years constituted a small proportion of the study population.

Table 2: Distribution according to gravidity (n = 650)

S.No	Gravidity	Cases	Percentage
1	G2	420	64.6
2	G3	180	27.7
3	G4	30	4.6
4	≥G5	20	3.1

Most of the women included in the study were second gravida (64.6 percent), followed by third gravida (27.7 percent).

Table 3: Mode of delivery among women undergoing trial of labour (n = 230)

S. No	Delivery method	Number	Percentage
1	Spontaneous vaginal delivery	65	43.3
2	Augmentation with ARM	42	28.0
3	ARM with oxytocin augmentation	9	6.0
4	Mechanical cervical dilatation	22	14.7
5	Prostaglandin induction (PGE2)	12	8.0

Among the women undergoing trial of labour, 150 achieved successful vaginal delivery. Of these, 65 women delivered spontaneously, while the remaining cases required augmentation with mechanical or pharmacological methods.

Table 4: Intraoperative findings and complications

Finding	Elective LSCS (n=420)	Emergency LSCS (n=80)	VBAC (n=150)	Total
Adhesions	54	11	0	65
Bladder advancement and edema	12	5	0	17
Thinned lower uterine segment	28	9	0	37
Vascular lower uterine segment	12	3	0	15
Scar dehiscence	0	3	0	3
Uterine anomalies	12	2	0	14
Extension of uterine incision	5	3	0	8
Change of uterine incision	9	3	0	12
Hemostatic sutures	5	2	0	7
Intraoperative hemorrhage	5	1	1	7
Blood transfusion required	5	2	1	8

Adhesions were the most frequent intraoperative finding in repeat caesarean deliveries. Thinning of the lower uterine segment and bladder adhesions were also observed in several cases.

Table 5: Perinatal outcome

Outcome	Elective LSCS (n=420)	Emergency LSCS (n=80)	VBAC (n=150)	Total
Stillbirth	3	1	1	5
NICU admission	14	2	2	18

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Neonatal death within 24 hours	4	1	1	6
Death within 7 days	5	1	1	7

NICU admission was observed in 18 neonates, with slightly higher frequency among babies delivered by elective caesarean section.

Table 6: Perinatal morbidity

Outcome	Elective LSCS	Emergency LSCS	VBAC
Birth asphyxia	8	1	1
Meconium aspiration syndrome	10	3	1
Prematurity	6	1	1
Congenital anomaly	5	1	1
Neonatal sepsis	5	1	1

Birth asphyxia and meconium aspiration syndrome were among the most commonly observed neonatal complications.

Table 7: Post-delivery maternal morbidity

ConditiPn	LSCS (n=500)	VBAC (n=150)
Hospital stay more than 4 days	50	5
Delayed ambulation (>72 hours)	56	0
Requirement of postnatal IV/IM analgesia	435	30
Oral diet within 24 hours	296	133
Paralytic ileus	9	0
Prolonged catheterization	22	0

Women who underwent caesarean section experienced higher postoperative morbidity compared with those who delivered vaginally.

DISCUSSION

The present hospital-based study conducted at Saheed Laxman Nayak Medical College and Hospital evaluated maternal and perinatal outcomes among women with previous caesarean section and examined the feasibility of trial of labour after caesarean in a tertiary care setting.

The age distribution of participants showed that the majority of women belonged to the 20–29 year age group. This age group represents the peak reproductive period and is consistent with findings reported by Minsart et al., who observed that women younger than 35 years had higher rates of successful vaginal birth after caesarean.[23]

Gravidity analysis in the present study demonstrated that most participants were second gravida. This pattern reflects changing demographic trends in India, where couples generally prefer smaller families with two or three children. Similar findings were reported in earlier obstetric studies evaluating VBAC outcomes.[24]

In the current study, trial of labour after caesarean was offered to carefully selected women after detailed clinical assessment. Among those who underwent trial of labour, approximately two-thirds achieved successful vaginal delivery. The VBAC success rate of about 65 percent observed in this study is comparable to the success rate of 61.4 percent reported by Shah Jitesh Mafatlal et al.[24] These findings reinforce the evidence that VBAC can be a safe alternative to routine repeat caesarean section when appropriate selection criteria are followed.

Intraoperative findings revealed that adhesions were the most frequent complication encountered during repeat caesarean deliveries. Adhesions between abdominal layers and intra-abdominal structures may increase operative difficulty and prolong surgical time. Similar observations were reported by Ramakrishna Rao, who documented intraperitoneal adhesions in approximately one-quarter of women undergoing repeat caesarean section.[25]

Perinatal outcomes in the present study showed that neonatal morbidity and NICU admissions were slightly higher among infants delivered by elective repeat caesarean section compared with those delivered vaginally. Loebel et al. also reported higher neonatal morbidity in elective repeat caesarean sections compared with successful VBAC deliveries.[26]

Furthermore, neonatal complications such as birth asphyxia, meconium aspiration syndrome, and prematurity were observed in a small proportion of cases. These complications were more commonly seen among operative deliveries, particularly when obstetric indications necessitated surgical intervention. Similar patterns were reported in studies by Jinturkar et al., where NICU admission rates were higher among repeat caesarean deliveries than among vaginal births after caesarean.[27]

Maternal morbidity analysis demonstrated that women undergoing caesarean section experienced longer hospital stays, delayed ambulation, and greater requirement for postoperative analgesia compared with women who achieved vaginal birth after caesarean. These findings are consistent with the observations of Yun-Xiu Li et al., who reported significantly higher postoperative analgesic requirements in women delivered by caesarean section compared with those delivered vaginally.[28]

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Overall, the findings of the present study highlight that trial of labour after caesarean, when undertaken in carefully selected women with appropriate monitoring and emergency obstetric facilities, can result in favourable maternal and neonatal outcomes. Encouraging VBAC in suitable cases may therefore help reduce the rising rates of repeat caesarean sections while maintaining maternal and perinatal safety.

CONCLUSION

The present hospital-based study evaluating women with previous caesarean section demonstrated that trial of labour after caesarean can be a safe and effective strategy when undertaken in appropriately selected cases and in facilities equipped for continuous intrapartum monitoring and emergency operative intervention. Approximately two-thirds of women who underwent trial of labour achieved successful vaginal birth, indicating a favorable VBAC success rate in the study setting.

Repeat caesarean section was associated with higher intraoperative findings such as adhesions and thinning of the lower uterine segment, as well as greater postoperative morbidity including delayed ambulation, prolonged hospitalization, and increased analgesic requirement. Neonatal outcomes were generally comparable between delivery groups, although slightly higher NICU admission rates were observed among infants delivered by caesarean section.

These findings suggest that promoting carefully supervised trial of labour after caesarean may contribute to reducing the rising rates of repeat caesarean sections while maintaining maternal and neonatal safety. Strengthening clinical decision-making protocols and ensuring the availability of skilled obstetric care remain essential for optimizing outcomes in women with a previous caesarean delivery.

REFERENCES

1. Geboes K, Dewit O, Moreels TG, Faa G, Jouret-Mourin A. Inflammatory bowel diseases. Colitis Pract Approach Colon Ileum Biopsy Interpret. 2018;107–40.
2. Brooks A, Rowse G, Ryder A, Peach E, Corfe B, Lobo A. Systematic review: psychological morbidity in young people with inflammatory bowel disease–risk factors and impacts. Aliment Pharmacol Ther. 2016;44(1):3–15.
3. Minici R, Siciliano MA, Ammendola M, Santoro RC, Barbieri V, Ranieri G, et al. Prognostic role of Neutrophil-to-Lymphocyte Ratio (NLR), Lymphocyte-to-Monocyte Ratio (LMR), Platelet-to-Lymphocyte Ratio (PLR) and Lymphocyte-to-C Reactive Protein Ratio (LCR) in Patients with Hepatocellular Carcinoma (HCC) undergoing Chemoembolizations (TACE) of the Liver: the unexplored corner linking tumor microenvironment, biomarkers and interventional radiology. Cancers. 2022;15(1):257.
4. Chen CC, Lee IK, Liu JW, Huang SY, Wang L. Utility of C-reactive protein levels for early prediction of dengue severity in adults. BioMed Res Int. 2015;2015.
5. Stojkovic Lalosevic M, Pavlovic Markovic A, Stankovic S, Stojkovic M, Dimitrijevic I, Radoman Vujacic I, et al. Combined diagnostic efficacy of neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), and mean platelet volume (MPV) as biomarkers of systemic inflammation in the diagnosis of colorectal cancer. Dis Markers. 2019;2019.
6. Fu W, Fu H, Ye W, Han Y, Liu X, Zhu S, et al. Peripheral blood neutrophil-to-lymphocyte ratio in inflammatory bowel disease and disease activity: a meta-analysis. Int Immunopharmacol. 2021;101:108235.
7. Celikbilek M, Dogan S, Ozbakır O, Zararsız G, Kücük H, Gürsoy S, et al. Neutrophil–lymphocyte ratio as a predictor of disease severity in ulcerative colitis. J Clin Lab Anal. 2013;27(1):72–6.
8. Torun S, Tunc BD, Suvak B, Yildiz H, Tas A, Sayilir A, et al. Assessment of neutrophil-lymphocyte ratio in ulcerative colitis: a promising marker in predicting disease severity. Clin Res Hepatol Gastroenterol. 2012;36(5):491–7.
9. Guthrie GJ, Charles KA, Roxburgh CS, Horgan PG, McMillan D, Clarke SJ. The systemic inflammation-based neutrophil–lymphocyte ratio: experience in patients with cancer. Critical Reviews in Oncology. 2013;88:218–230. doi:10.1016/j.critrevonc.2013.03.010.
10. Chin AC, Parkos CA. Neutrophil transepithelial migration and epithelial barrier function in inflammatory bowel disease: potential targets for inhibiting neutrophil trafficking. Annals of the New York Academy of Sciences. 2006;1072:276–287. doi:10.1196/annals.1326.018.
11. Zhou GX, Liu ZJ. Potential roles of neutrophils in regulating intestinal mucosal inflammation in inflammatory bowel disease. Journal of Digestive Diseases. 2017;18:495–503. doi:10.1111/1751-2980.12540.
12. Moran CP, Neary B, Doherty G. Endoscopic evaluation in the diagnosis and management of inflammatory bowel disease. World Journal of Gastrointestinal Endoscopy. 2016;8:723–732. doi:10.4253/wjge.v8.i20.723.
13. Soubières AA, Poullis A. Emerging biomarkers for the diagnosis and monitoring of inflammatory bowel diseases. Inflammatory Bowel Diseases. 2016;22:2016–2022. doi:10.1097/MIB.0000000000000836.
14. Baron JH, Connell AM, Lennard-Jones JE. Variation between observers in describing mucosal appearances in proctocolitis. British Medical Journal. 1964;1:89–92. doi:10.1136/bmj.1.5375.89.
15. Marlicz W, Skonieczna-Żydecka K, Dabos KJ, Łoniewski I, Koulaouzidis A. Emerging concepts in non-invasive monitoring of Crohn's disease. Therapeutic Advances in Gastroenterology. 2018;11:1–20. doi:10.1177/1756284818769076.
16. Xu M, Wang W, Chen Y, Zhu J, Zhang J. Correlation between serological biomarkers and disease activity in patients with inflammatory bowel disease. Biomed Res Int. 2021;2019:985192.
17. Ng SC, Tang W, Ching JY, Wong M, Chow CM, Hui A, et al. Incidence and phenotype of inflammatory bowel disease based on results from the Asia-pacific Crohn's and colitis epidemiology study. Gastroenterology. 2013;145(1):158–65.
18. Feng W, Liu Y, Zhu L, Xu L, Shen H. Evaluation of neutrophil-to-lymphocyte ratio and platelet-to-lymphocyte ratio as potential markers for ulcerative colitis: a retrospective study. BMC Gastroenterol. 2022;22:485.
19. Langley BO, Guedry SE, Goldenberg JZ, Hanes DA, Beardsley JA, Ryan JJ. Inflammatory bowel disease and neutrophil–lymphocyte ratio: a systematic scoping review. J Clin Med. 2021;10(18):4219.
20. Nishida Y, Hosomi S, Yamagami H, Yukawa T, Otani K, Nagami Y, et al. Neutrophil-to-lymphocyte ratio for predicting loss of response to infliximab in ulcerative colitis. PloS One. 2017;12(1):e0169845.

ISSN (O): 2687-5365; ISSN (P): 2753-6556