ORIGINAL ARTICLE

Association between mean platelet volume and acute cholecystitis in pregnant patients with right upper quadrant pain: A multicenter retrospective cohort study

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ABSTRACT

BACKGROUND: Physiological and hematological changes during pregnancy may complicate the interpretation of conventional inflammatory markers in patients with suspected acute cholecystitis (AC). This study aimed to evaluate the association between mean platelet volume (MPV), derived from routine complete blood count analysis, and AC in pregnant patients and to investigate whether this association remained consistent across pregnancy trimesters.

METHODS: This retrospective multicenter exploratory cohort study included 112 pregnant patients presenting with right upper quadrant pain between 2022 and 2025. According to retrospective classification based on the Tokyo Guidelines 2018 criteria, 89 patients were classified as AC and 23 as non-cholecystitis (NC). MPV and other hematological parameters were compared between the groups. Logistic regression analysis adjusted for pregnancy trimester was performed to evaluate the association between MPV and AC. Receiver operating characteristic (ROC) curve analysis with confidence intervals (CIs) was performed to assess the exploratory discriminative performance of MPV.

RESULTS: MPV levels were significantly higher in the AC group than in the NC group (10.6 fL vs. 10.3 fL, p=0.034). In univariable logistic regression analysis, MPV was significantly associated with AC (odds ratio [OR]: 1.734, 95% CI: 1.203–2.500, p=0.003), and this association remained significant after adjustment for pregnancy trimester (OR: 1.870, 95% CI: 1.251–2.794, p=0.002). No significant associations were observed for white blood cell, neutrophil-to-lymphocyte ratio, platelet count, or platelet-to-lymphocyte ratio. ROC analysis demonstrated limited discriminative performance for MPV (area under the curve: 0.655). At the identified cut-off value of 8.70 fL, sensitivity was 95.2% and specificity was 36.4%.

CONCLUSION: MPV was significantly associated with AC in pregnant patients; however, its limited discriminative performance and low specificity suggest that it should not be used as an independent diagnostic marker. MPV may provide supportive diagnostic value when interpreted together with clinical and ultrasonographic findings. Larger prospective studies including standardized MPV measurements and pregnancy-specific diagnostic frameworks are needed to better define the diagnostic role of MPV in pregnant patients with suspected AC.

Keywords: Acute cholecystitis; inflammatory markers; mean platelet volume; pregnancy; right upper quadrant pain.

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INTRODUCTION

Acute cholecystitis (AC) is one of the most common non-obstetric surgical emergencies encountered during pregnancy, with an estimated incidence of 0.02–0.05%.[1,2] Pregnancy-related hormonal changes, particularly progesterone-induced gallbladder hypomotility, increase biliary stasis and gallstone formation, predisposing pregnant patients to biliary diseases including AC.[3] Delayed or missed diagnosis may lead to adverse maternal and fetal outcomes; therefore, early and accurate diagnosis remains clinically important.[4,5]

The Tokyo Guidelines 2018 (TG18) provide widely accepted diagnostic criteria for AC by combining clinical findings, systemic inflammatory markers, and imaging results.[6] However, physiological hematological changes during pregnancy may complicate the interpretation of conventional inflammatory markers. Physiological leukocytosis and trimester-related variations in inflammatory parameters may reduce the diagnostic specificity of routine laboratory tests in symptomatic pregnant patients.[7-9] Therefore, imaging studies play a central role in the diagnostic evaluation of suspected AC during pregnancy.

Ultrasonography is considered the first-line imaging modality in pregnant patients with suspected AC because of its accessibility and lack of ionizing radiation.[10,11] Nevertheless, ultrasonographic findings may occasionally be inconclusive, particularly in early-stage disease or in patients with nonspecific clinical presentation.[12,13] In routine clinical practice, some pregnant patients presenting with right upper quadrant pain may have biliary colic or other symptomatic biliary conditions rather than definite AC. Therefore, interest has increased in additional laboratory parameters that may support clinical evaluation.

Mean platelet volume (MPV) is an inexpensive and easily accessible parameter obtained from routine complete blood count analysis. It reflects platelet size and activation and has been investigated as an inflammatory marker in several inflammatory and surgical conditions.[14] Larger platelets are considered metabolically and enzymatically more active and may be associated with systemic inflammatory response.[15,16] However, the clinical significance of MPV in pregnant patients remains unclear.

Previous studies evaluating the role of MPV in AC have reported inconsistent results.[17-19] In addition, most available studies have been conducted in non-pregnant populations, and data regarding pregnant patients remain limited. Pregnancy-related hematological changes may further complicate the interpretation of MPV in this population.

Therefore, this study aimed to investigate the association between MPV and AC in pregnant patients presenting with right upper quadrant pain and to evaluate whether this association remained consistent across pregnancy trimesters. In addition, MPV was compared with conventional inflammatory parameters including white blood cell count (WBC), neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), and platelet count (PLT).

MATERIALS AND METHODS

Study Design and Ethical Approval

This retrospective multicenter exploratory cohort study was conducted in four hospitals located in different regions of Türkiye, including three tertiary referral training and research hospitals and one secondary care hospital, between 2022 and 2025. All participating centers provided emergency and obstetric care services. Laboratory data were obtained as part of routine clinical practice.

The study was approved by the Ethics Committee of Etlik City Hospital (Date: 10.02.2026, Decision no: AEŞH-BADEK2-2026-095) and was conducted in accordance with the principles of the Declaration of Helsinki. Patient data were retrospectively collected from electronic medical records and anonymized before analysis. Written informed consent was waived because of the retrospective nature of the study.

Patient Selection

Pregnant patients presenting with right upper quadrant pain and evaluated for hepatobiliary pathology during the study period were retrospectively screened using emergency department records, obstetric and surgical consultation notes, imaging reports, and electronic medical records. Case identification was not based solely on diagnostic codes, and all potentially eligible patients were confirmed by manual chart review.

The inclusion criteria were as follows: (1) Age ≥18 years, (2) ongoing pregnancy, (3) presentation with right upper quadrant pain, (4) availability of complete blood count parameters at admission, and (5) completed abdominal ultrasonographic evaluation.

The exclusion criteria were as follows: (1) Known hematological disease or thrombocytopenia, (2) active malignancy or immunosuppressive therapy, (3) autoimmune disease, and (4) concomitant infectious or systemic inflammatory conditions that could affect inflammatory laboratory parameters.

A total of 129 patients were initially screened. Seventeen patients were excluded because of missing laboratory data (n=5), insufficient imaging documentation (n=9), or predefined exclusion criteria (n=3). Consequently, 112 patients were included in the final analysis. No data imputation was performed for missing data.

Diagnostic Classification

All eligible patients were retrospectively reclassified according to the diagnostic principles of the TG18 using available clinical, laboratory, and imaging findings. This approach was used to reduce inter-center variability in diagnostic classification.

TG18 diagnostic criteria included local inflammatory findings (right upper quadrant pain and/or Murphy's sign), systemic inflammatory findings (fever and/or leukocytosis; C-reactive

protein [CRP] when available), and imaging findings including gallbladder wall thickening ≥3 mm, pericholecystic fluid, or ultrasonographic Murphy's sign.

Patients with clinical, laboratory, and imaging findings compatible with TG18 criteria were classified as the AC group. Patients presenting with right upper quadrant pain who did not meet TG18 diagnostic criteria for AC and were considered compatible with biliary colic were classified as the non-cholecystitis (NC) group.

Gestational age was determined according to obstetric records. Pregnancy trimesters were defined as 1st trimester (1–13 weeks), second trimester (14–27 weeks), and third trimester (≥28 weeks).

Variables

The primary study variable was MPV, fL measured at admission. Secondary variables included age, pregnancy trimester, (WBC, $\times 10^3/\mu L$), neutrophil count, lymphocyte count, NLR, (PLT, $\times 10^3/\mu L$), PLR, length of hospital stay, and treatment modality.

All laboratory measurements were obtained during the initial emergency department evaluation. Complete blood count parameters, including MPV, were analyzed using automated hematology analyzers routinely used at each participating center. Laboratory data were retrospectively extracted from electronic medical records.

Because CRP measurements were not consistently available in all patients because of the retrospective multicenter design, CRP was not included in the primary comparative analyses.

Statistical Analysis

All statistical analyses were performed using Python software (version 3.12) with the SciPy, NumPy, scikit-learn, and statsmodels libraries. The distribution of continuous variables was assessed using the Shapiro–Wilk test. Non-normally distributed variables were expressed as median and interquartile range (IQR) (Q1–Q3).

Continuous variables were compared using the Mann–Whitney U test, whereas categorical variables were analyzed using the Chi-square test or Fisher's exact test, as appropriate.

The association between MPV and AC was evaluated using univariable and pregnancy trimester-adjusted logistic regression analyses. Results were presented as odds ratios with 95% confidence intervals (CIs).

Receiver operating characteristic (ROC) curve analysis was performed to evaluate the discriminative performance of MPV for AC. The area under the curve (AUC) and 95% CI were calculated using a bootstrap method with 2000 resamples. The optimal cut-off value was determined using the Youden index, and sensitivity and specificity were reported.

No formal sample size or power calculation was performed because all eligible patients meeting the inclusion criteria during the study period were included in the analysis.

A two-sided $p<0.05$ was considered statistically significant.

RESULTS

Patient Characteristics

A total of 112 pregnant patients were included in the study. Of these, 89 patients (79.5%) were classified as AC and 23 patients (20.5%) as NC.

The median age was 29.0 years (IQR: 25.0–34.0) in the AC group and 30.0 years (IQR: 25.5–32.5) in the NC group, with no significant difference between the groups (p=0.837). Pregnancy trimester distribution was also similar between the groups (p=0.286). In both groups, most patients were in the third trimester (AC: 48.3%; NC: 56.5%). Demographic and clinical characteristics are presented in Table 1.

The median length of hospital stay was 4.0 days (IQR: 3.0–7.0) in the AC group and 3.0 days (IQR: 2.0–5.5) in the NC group (p=0.087). Conservative medical treatment was the most common management approach in the AC group (n=73, 82.0%), followed by laparoscopic cholecystectomy (n=9, 10.1%), open cholecystectomy (n=5, 5.6%), and percutaneous drainage (n=2, 2.2%).

Inflammatory Laboratory Parameters

Comparisons of inflammatory laboratory parameters are presented in Table 2. No significant differences were observed between the AC and NC groups regarding WBC, neutrophil count, lymphocyte count, NLR, PLT, or PLR (all p>0.05).

MPV was the only hematological parameter that differed significantly between the groups. Median MPV was significantly higher in the AC group than in the NC group (10.6 fL [IQR: 9.8–11.3] vs. 10.3 fL [IQR: 8.3–10.8], p=0.034).

Additional exploratory analyses performed within the AC group demonstrated a moderate negative correlation between MPV and PLT (rho=−0.49, p<0.001). A weaker negative correlation was observed between MPV and PLR (rho=−0.33, p=0.002). No significant correlations were identified between MPV and other inflammatory parameters (Supplementary Table 1).

MPV values did not differ significantly between pregnancy trimesters in the AC group (p=0.551) (Supplementary Table 2).

Logistic Regression Analysis

In univariable logistic regression analysis, MPV was significantly associated with AC (OR: 1.734, 95% CI: 1.203–2.500, p=0.003). This association remained significant after adjustment for pregnancy trimester (OR: 1.870, 95% CI: 1.251–2.794, p=0.002).

No significant associations were observed for age, WBC, NLR, PLT, or PLR in either unadjusted or trimester-adjusted analyses. Logistic regression results are presented in Table 3.

Table 1. Demographic and clinical characteristics of study participants

Variable	Non-cholecystitis (n=23) (%)	Acute cholecystitis (n=89) (%)	p
Age (years) – median (IQR)	30.0 (25.5–32.5)	29.0 (25.0–34.0)	0.837
Gestational age (trimester)			0.286
1st trimester	2 (8.7)	21 (23.6)	—
2nd trimester	8 (34.8)	25 (28.1)	—
3rd trimester	13 (56.5)	43 (48.3)	—
Length of hospital stay (days) – Median (IQR)	3.0 (2.0–5.5)	4.0 (3.0–7.0)	0.087
Treatment (AC group), n (%)			—
Medical management	—	73 (82.0)	—
Laparoscopic cholecystectomy	—	9 (10.1)	—
Open cholecystectomy	—	5 (5.6)	—
Percutaneous drainage	—	2 (2.2)	—

IQR: Interquartile range; AC: Acute cholecystitis. Group comparisons were performed using Mann–Whitney U test for continuous variables and Chi-square or Fisher's exact test, where appropriate, for categorical variables. Treatment data are presented only for the acute cholecystitis group.

Table 2. Comparison of inflammatory laboratory parameters between groups

Parameter	Non-cholecystitis (n=23) median (IQR)	Acute cholecystitis (n=89) median (IQR)	p
WBC (×10³/μL)	10.7 (8.3–13.0)	10.7 (9.3–12.4)	0.513
Neutrophil (×10³/μL)	7.6 (6.1–9.9)	8.0 (6.6–9.6)	0.469
Lymphocyte (×10³/μL)	2.0 (1.5–2.5)	1.6 (1.3–2.2)	0.337
NLR	4.6 (3.0–5.6)	4.2 (3.2–7.1)	0.426
PLT (×10³/μL)	264.0 (225.4–288.0)	251.0 (222.0–311.0)	0.674
PLR	128.1 (104.6–170.5)	148.8 (115.4–200.5)	0.186
MPV (fL)	10.3 (8.3–10.8)	10.6 (9.8–11.3)	0.034*

Values are expressed as median (IQR). WBC: White blood cell count; NLR: Neutrophil-to-lymphocyte ratio; PLT: Platelet count; PLR: Platelet-to-lymphocyte ratio; MPV: Mean platelet volume; IQR: Interquartile range. Group comparisons were performed using Mann–Whitney U test. *p<0.05 indicates statistical significance.

Table 3. Logistic regression analysis of factors associated with acute cholecystitis

Variable	Univariable analysis OR (95% CI)	p	Trimester-adjusted Analysis OR (95% CI)	p
Age (years)	1.019 (0.937–1.109)	0.659	1.015 (0.933–1.103)	0.734
WBC (×103/μL)	1.064 (0.916–1.235)	0.417	1.081 (0.924–1.265)	0.330
NLR	1.110 (0.940–1.311)	0.219	1.131 (0.948–1.350)	0.172
PLT (×103/μL)	1.003 (0.996–1.010)	0.460	1.002 (0.995–1.009)	0.566
PLR	1.003 (0.996–1.010)	0.368	1.003 (0.996–1.010)	0.375
MPV (fL)	1.734 (1.203–2.500)	0.003*	1.870 (1.251–2.794)	0.002*

OR: Odds ratio; CI: Confidence interval; WBC: White blood cell count; NLR: Neutrophil-to-lymphocyte ratio; PLT: Platelet count; PLR: Platelet-to-lymphocyte ratio; MPV: Mean platelet volume. *p<0.05 indicates statistical significance.

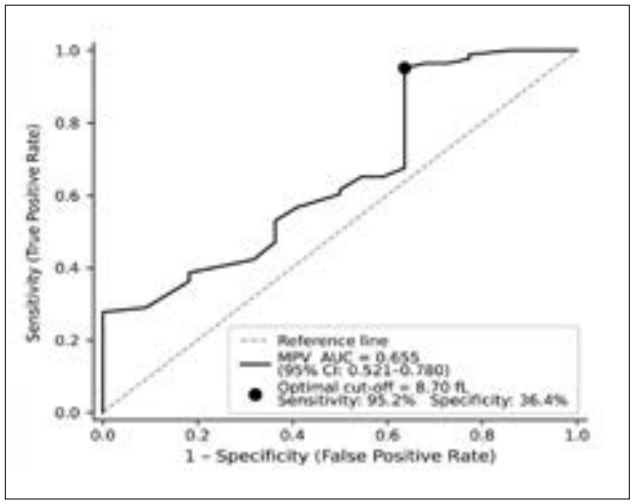

Figure 1. Receiver operating characteristic curve of mean platelet volume for acute cholecystitis in pregnancy (AUC=0.655; 95% CI: 0.521–0.780). The optimal cut-off value was 8.70 fL; at this threshold, sensitivity was 95.2% and specificity was 36.4%

ROC Analysis

ROC curve analysis was performed to evaluate the discriminative performance of MPV for AC (Fig. 1). The AUC was 0.655 (95% CI: 0.521–0.780).

The optimal cut-off value determined using the Youden index was 8.70 fL. At this threshold, sensitivity was 95.2%, specificity was 36.4%, positive predictive value was 85.3%, and negative predictive value was 57.1%.

DISCUSSION

In this retrospective multicenter cohort study, MPV was the only hematological parameter significantly associated with AC in pregnant patients presenting with right upper quadrant pain, and this association remained significant after adjustment for pregnancy trimester. In contrast, conventional inflammatory parameters including WBC, NLR, PLT, and PLR did not differ significantly between the groups. Although statistical significance was achieved, the absolute intergroup difference was modest (10.6 fL vs. 10.3 fL), and ROC analysis demonstrated limited discriminative performance (AUC: 0.655) with high sensitivity but low specificity at the identified cut-off value. Accordingly, MPV should not be used as an independent diagnostic marker in this population; rather, it may serve as a supportive parameter when interpreted together with clinical and ultrasonographic findings.

The evaluation of biliary disease during pregnancy may be challenging because of physiological and hematological changes associated with gestation.[3] Physiological leukocytosis and trimester-related variations in inflammatory markers may reduce the diagnostic value of conventional laboratory parameters in pregnant patients.[7-9] Previous studies have demonstrated that pregnancy-specific reference ranges may be necessary for inflammatory markers such as WBC and CRP.[8,20] In the present study, the absence of significant differences in traditional inflammatory parameters between groups likely reflects these pregnancy-related physiological changes. Ultrasonography remains the primary imaging modality in this population because of its safety and lack of ionizing radiation;[10,12,13] however, findings may occasionally be inconclusive, particularly in early-stage disease or nonspecific presentations. In this context, investigation of additional routine complete blood count-derived parameters that may complement clinical evaluation appears clinically reasonable.

MPV has been investigated as a potential inflammatory marker in several inflammatory and surgical diseases.[14] Larger platelets are considered metabolically and enzymatically more active and may contribute to increased platelet activation and proinflammatory mediator release.[15,21] In the present study, higher MPV levels in the AC group may suggest a role for platelet activation in the inflammatory process. Nevertheless, the biological behavior of MPV during acute inflammation remains complex and may be influenced by disease severity, platelet consumption dynamics, laboratory methodology, and patient characteristics.[14,17] However, a statistically significant association does not necessarily translate into sufficient clinical diagnostic utility, and the modest absolute difference observed in this study should be considered accordingly.

Previous studies evaluating MPV in AC have reported conflicting results. Sayit et al.[18] reported lower MPV values in AC, whereas Eroğlu et al.[17] suggested that MPV may be associated with inflammatory activity. More recent studies have also demonstrated heterogeneous findings regarding platelet indices in AC.[19,22] These discrepancies may reflect differences in study design, patient populations, disease severity, laboratory standardization, and comparator group selection. Unlike most prior studies using healthy volunteers as controls, the present study employed a symptomatic comparison group of pregnant patients with right upper quadrant pain who did not fulfill TG18 criteria for AC. This design better reflects real-world clinical practice, where the differential diagnosis frequently includes biliary colic and other biliary disorders. Notably, because the NC group consisted primarily of symptomatic patients with biliary colic rather than healthy controls, some biological overlap between groups was expected, which may partly explain the modest discriminative performance of MPV.

In addition, MPV values did not differ significantly across pregnancy trimesters within the AC group (p=0.551), suggesting that the observed association was not substantially confounded by gestational age. This consistency across trimesters may be considered a methodological strength of the present study. The trimester-adjusted logistic regression further confirmed this finding, with the association between MPV and AC remaining significant after adjustment (OR: 1.870, 95% CI: 1.251–2.794, p=0.002).

Several limitations should be acknowledged. The retrospec-

tive design may have introduced selection bias and limited control over confounding variables. The multicenter structure may have resulted in methodological heterogeneity, particularly regarding preanalytical variables known to influence MPV measurements, including anticoagulant exposure time, analyzer platform differences, and sample processing delays. The relatively small and imbalanced comparison groups may have limited statistical precision. CRP measurements were not consistently available because of the retrospective multicenter design and could not be incorporated into the primary analyses. These findings should therefore be interpreted within an exploratory rather than confirmatory framework.

Despite these limitations, this study provides one of the few multicenter evaluations of MPV in pregnant patients with suspected AC. The use of trimester-adjusted analyses and a symptomatic real-world comparator cohort enhances the clinical relevance of the findings. Larger prospective studies with standardized MPV measurement protocols and pregnancy-specific diagnostic frameworks are needed to better define the diagnostic role of MPV in this population.

CONCLUSION

In this retrospective multicenter exploratory cohort study, MPV was significantly associated with AC in pregnant patients presenting with right upper quadrant pain. However, its limited discriminative performance and low specificity suggest that MPV should not be used as an independent diagnostic marker. MPV may be considered a complementary parameter within a multimodal diagnostic approach incorporating clinical evaluation and ultrasonographic assessment. Larger prospective studies including standardized MPV measurements and pregnancy-specific clinical evaluation are needed to better define the diagnostic value of MPV in pregnant patients with suspected AC.

Ethics Committee Approval: This study was approved by the Ethics Committee of Etlik City Hospital (Date: 10.02.2026, Decision No: AEŞH-BADEK2-2026-095).

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Conflict of Interest: None declared.

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ORİJİNAL ÇALIŞMA - *ÖZ*

Sağ üst kadran ağrısı olan gebe hastalarda ortalama trombosit hacmi ile akut kolesistit arasındaki ilişki: çok merkezli retrospektif kohort çalışması

AMAÇ: Gebelikte ortaya çıkan fizyolojik ve hematolojik değişiklikler, akut kolesistit (AK) şüphesi olan hastalarda geleneksel inflamatuvar belirteçlerin yorumlanmasını güçleştirebilir. Bu çalışmada, rutin tam kan sayımı analizinden elde edilen ortalama trombosit hacminin (MPV), sağ üst kadran ağrısıyla başvuran gebe hastalarda akut kolesistit ile ilişkisini değerlendirmek ve bu ilişkinin gebelik trimesterleri boyunca tutarlı olup olmadığını araştırmak amaçlandı.

GEREÇ VE YÖNTEM: Bu retrospektif çok merkezli kohort çalışmasına, 2022–2025 yılları arasında sağ üst kadran ağrısıyla başvuran 112 gebe hasta dahil edildi. Tokyo Kılavuzu 2018 (TG18) tanı kriterlerine göre hastalar akut kolesistit (AK, n=89) ve non-kolesistit (NK, n=23) olarak sınıflandırıldı. MPV ve diğer hematolojik parametreler gruplar arasında karşılaştırıldı. MPV ile akut kolesistit arasındaki ilişkiyi değerlendirmek amacıyla tek değişkenli ve gebelik trimesterine göre düzeltilmiş lojistik regresyon analizleri yapıldı. MPV'nin tanısal performansı ROC eğrisi analizi ile değerlendirildi.

BULGULAR: AK grubunda MPV düzeyi NK grubuna göre anlamlı olarak daha yüksekti (10.6 fL'ye karşı 10.3 fL, p=0.034). Tek değişkenli analizde MPV, akut kolesistit ile anlamlı ilişkili bulundu (OR: 1.734, %95 GA: 1.203–2.500; p=0.003) ve bu ilişki gebelik trimesterine göre düzeltme sonrasında da anlamlılığını korudu (OR: 1.870, %95 GA: 1.251–2.794; p=0.002). Beyaz küre sayısı, nötrofil/lenfosit oranı, trombosit sayısı ve trombosit/lenfosit oranı açısından anlamlı ilişki saptanmadı. ROC analizinde MPV'nin ayırt edici performansı sınırlı bulundu (EAA=0.655). Belirlenen 8.70 fL kesim değerinde duyarlılık %95.2, özgüllük %36.4 olarak hesaplandı.

SONUÇ: MPV, akut kolesistit şüphesi olan gebe hastalarda akut kolesistit ile anlamlı ilişkili bulunmuştur; ancak sınırlı ayırt edici performansı ve düşük özgüllüğü nedeniyle bağımsız bir tanı belirteci olarak kullanılmamalıdır. MPV, klinik değerlendirme ve ultrasonografik bulgular ile birlikte yorumlandığında destekleyici tanısal katkı sağlayabilir. Gebelikte akut kolesistitin tanısal değerlendirmesindeki rolünün daha iyi belirlenmesi için standartlaştırılmış MPV ölçümleri ve gebeliğe özgü tanısal yaklaşımlar içeren geniş ölçekli prospektif çalışmalara ihtiyaç vardır.

Anahtar sözcükler: Akut kolesistit; gebelik; enflamatuvar belirteçler; ortalama trombosit hacmi; sağ üst kadran ağrısı.

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Supplementary Table 1. Spearman correlation analysis between MPV and other inflammatory parameters in the acute cholecystitis group (n=89)

Parameter	Spearman's rho	p
PLT (Platelet count)	−0.49	<0.001
PLR (Platelet-to-lymphocyte ratio)	−0.33	0.002
NLR (Neutrophil-to-lymphocyte ratio)	−0.10	0.329
WBC (White blood cell count)	−0.10	0.330
Neutrophil count	−0.11	0.310
Lymphocyte count	−0.00	0.984
Length of hospital stay (days)	−0.03	0.720
Age (years)	0.04	0.672

MPV: Mean platelet volume; PLT: Platelet count; PLR: Platelet-to-lymphocyte ratio; NLR: Neutrophil-to-lymphocyte ratio; WBC: White blood cell count. Bold rows indicate statistically significant correlations (p<0.05).

Supplementary Table 2. MPV values by trimester in the acute cholecystitis group

Variable	1st trimester (n=21)	2nd trimester (n=25)	3rd trimester (n=43)	p
MPV (fL)-Median (IQR)	10.6 (9.6–11.3)	10.7(10.2–11.3)	10.5(9.7–11.3)	0.551
MPV (fL)-Mean±SD	10.6±1.6	10.8±1.1	10.5 ± 1.2	—
MPV (fL)-Min-Max	7.5–13.1	8.2–13.3	8.1–13.6	—

MPV: Mean platelet volume; SD: Standard deviation; IQR: İnterquartile range. The Kruskal–Wallis test was used for between-group comparisons. No statistically significant difference was observed across trimesters (p=0.551).