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Research Article

Has acute diverticulitis ceased to be a disease of the elderly?

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ABSTRACT

Objective: This study aimed to determine whether acute diverticulitis can still be regarded solely as a disease of the elderly and to compare colonic localization, disease severity, and inflammatory indices between patients younger than 50 years and patients aged 50 years and older.

Materials and Methods: This retrospective cross-sectional study included 132 patients older than 18 years who were diagnosed with acute diverticulitis confirmed by contrast-enhanced abdominal computed tomography (CT) at Istanbul Haseki Training and Research Hospital between January 2017 and December 2021. Patients were divided into two groups: those younger than 50 years (n=64) and those aged 50 years and older (n=68). Diverticulitis localization was classified as distal (rectosigmoid/sigmoid/descending colon) or proximal (cecum/ascending colon/hepatic flexure). Disease severity was assessed according to the Hinchey classification, and Hinchey stage 1B or higher was defined as complicated diverticulitis. Demographic characteristics, comorbidities, laboratory parameters, and hemogram-derived inflammatory indices including neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), systemic immune-inflammation index (SII), lymphocyte-to-monocyte ratio (LMR), and C-reactive protein (CRP)-to-albumin ratio were analyzed. Groups were compared using the Chi-square test, Fisher's exact test, and Mann–Whitney U test.

Results: The overall mean age was 49.8±14.7 years. Male sex predominated among patients younger than 50 years (64.1%), whereas female sex predominated among patients aged 50 years and older (67.6%). Distal colonic involvement was similar in both groups (81.2% vs 82.4%; p=1.0). Overall, 82.6% of patients had Hinchey 1A disease. Although complicated diverticulitis appeared more frequent in younger patients, the difference was not statistically significant (20.3% vs 14.7%; p=0.536). Hypertension, cardiac disease, and previous abdominal surgery were significantly more common in patients aged 50 years and older. CRP levels and NLR showed a tendency to be higher in the older group, whereas the CRP-to-albumin ratio was significantly higher (1.14 [0.44–2.67] vs 1.78 [1.13–3.19]; p=0.045). PLR, SII, LMR, and length of hospital stay were similar between groups. Most patients were managed conservatively, consistent with the predominance of uncomplicated disease in the cohort.

Conclusion: Colonic localization of acute diverticulitis was similar in younger and older patients. Although complicated diverticulitis appeared numerically more frequent in younger patients, systemic inflammatory burden, particularly the CRP-to-albumin ratio, was more pronounced in patients aged 50 years and older. The comparable number of younger and older patients in the same center suggests that acute diverticulitis should no longer be regarded solely as a disease of the elderly. Larger prospective studies are needed to confirm these findings and to further clarify age-related differences in treatment and outcomes.

Keywords: acute diverticulitis, Hinchey classification, inflammatory indices, colonic diverticular disease

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Introduction

Colonic diverticular disease is a common condition that increases in frequency with age, particularly in Western populations, and may lead to substantial lifelong morbidity (1). Diverticula are most commonly located in the sigmoid colon. The pathogenesis is thought to involve age-related weakening of the colonic wall together with factors such as a low-fiber diet, chronic constipation, increased intraluminal pressure, obesity, sedentary lifestyle, smoking, and familial predisposition (2,3). Right-sided colonic diverticula are less common in Western societies; however, they may present at a younger age and are often considered a distinct clinical phenotype in which structural or genetic predisposition may play a more prominent role (4,5).

Acute diverticulitis is an inflammatory condition of diverticula with a clinical spectrum ranging from mild localized inflammation to perforation and generalized peritonitis (6-8). Contrast-enhanced CT is the principal diagnostic tool for assessing disease severity and guiding management, and the Hinchey classification remains one of the most commonly used staging systems. As the Hinchey stage increases, the risk of complications and the need for surgical intervention also increase (9).

In recent years, hemogram-derived inflammatory indices and acute phase reactants have emerged as practical biomarkers in predicting the severity of acute diverticulitis (10,11). NLR, PLR, SII, LMR, and the CRP-to-albumin ratio are easily calculated parameters reflecting systemic inflammatory burden. Several studies have shown that increased NLR, PLR, SII, and CRP-to-albumin ratio may be associated with higher Hinchey stages, complicated disease, and a greater need for intervention (12,13).

Current guidelines, including those of the European Society of Coloproctology and the World Society of Emergency Surgery, recommend classification of acute diverticulitis into uncomplicated and complicated forms based on CT findings, with treatment strategies tailored according to disease stage, including observation, antibiotic therapy, percutaneous drainage, and/or surgery (14,15).

This study was designed to investigate whether acute diverticulitis can still be considered solely a disease of the elderly. The primary aim was to compare colonic localization and disease severity between patients younger than 50 years and patients aged 50 years and older. Secondary aims were to compare comorbidity burden, baseline laboratory findings, inflammatory indices, treatment patterns, and length of hospital stay between age groups.

Materials and Methods

This retrospective cross-sectional study was conducted by reviewing the records of patients presenting to the emergency department or general surgery outpatient clinic of Istanbul Haseki Training and Research Hospital between January 2017 and December 2021 with a diagnosis of acute diverticulitis. Only patients older than 18 years with acute diverticulitis confirmed by contrast-enhanced abdominal CT and staged according to the Hinchey classification were included.

Based on CT reports, disease localization was categorized as distal colon (rectosigmoid, sigmoid, or descending colon) or proximal colon (cecum, ascending colon, or hepatic flexure). Patients with missing clinical or laboratory data and those without imaging-confirmed diagnosis were excluded from the study.

Demographic characteristics, baseline laboratory values, comorbidities, previous abdominal surgery history, and hospitalization records were obtained from the hospital information system. Laboratory parameters included white blood cell count, CRP, albumin, neutrophil count, lymphocyte count, monocyte count, and platelet count. Inflammatory indices were calculated as follows: NLR (neutrophil/lymphocyte), PLR (platelet/lymphocyte), SII

(neutrophil × platelet / lymphocyte), LMR (lymphocyte/monocyte), and CRP-to-albumin ratio.

Patients were divided into two groups according to age: patients younger than 50 years and patients aged 50 years and older. Disease severity was categorized according to the Hinchey classification, and Hinchey stage 1B or higher was considered complicated diverticulitis.

Available treatment-related data were also reviewed. Conservative management, hospitalization, and invasive interventions, when documented, were noted in order to better characterize the clinical course of the disease in both age groups.

Categorical variables were expressed as number and percentage, whereas continuous variables were presented as mean ± standard deviation or median [interquartile range], according to data distribution. Categorical variables were compared using the Chi-square test or Fisher's exact test, and continuous variables were compared using the Mann–Whitney U test. A p value below 0.05 was considered statistically significant. Ethical approval for the study was obtained from the local ethics committee.

Results

A total of 132 patients diagnosed with acute diverticulitis were included in the study (Table 1). Among them, 64 patients were younger than 50 years and 68 were aged 50 years and older. The overall mean age was 49.8±14.7 years. Mean age was 38.7±8.4 years in the younger group and 60.3±8.5 years in the older group.

Sex distribution differed significantly between the two groups. Male patients predominated among those younger than 50 years (41/64, 64.1%), whereas female patients predominated among those aged 50 years and older (46/68, 67.6%).

Comorbidity analysis is summarized in Table 1. Hypertension was significantly more frequent in patients aged 50 years and older (42.6% vs 6.2%, p<0.001). Similarly, cardiac disease, including coronary artery disease, arrhythmia, and heart failure, was significantly more common in the older group (14.7% vs 3.1%, p=0.044). Diabetes mellitus was numerically more frequent in older patients, although the difference did not reach statistical significance (17.6% vs 6.2%, p=0.082). A history of previous abdominal surgery was also significantly more common in the older group (25.0% vs 9.4%, p=0.034).

Evaluation of CT-based disease localization showed that distal colonic involvement was similar in both age groups. Among patients younger than 50 years, 52 cases (81.2%) had distal and 12 cases (18.8%) had proximal disease. Among patients aged 50 years and older, 56 cases (82.4%) had distal and 12 cases (17.6%) had proximal disease (p=1.0).

When disease severity was assessed according to the Hinchey classification, most patients had Hinchey 1A disease (109/132, 82.6%). In patients younger than 50 years, Hinchey stages were distributed as follows: stage 1A in 51 patients (79.7%), stage 1B in 9 patients (14.1%), and stage 2 in 4 patients (6.2%). No patient in this group had stage 3 disease. In patients aged 50 years and older, 58 patients (85.3%) had stage 1A, 4 patients (5.9%) had stage 1B, 2 patients (2.9%) had stage 2, and 4 patients (5.9%) had stage 3 disease. Although complicated diverticulitis was numerically more frequent among younger patients, the difference was not statistically significant (20.3% vs 14.7%, p=0.536).

In laboratory analysis, CRP levels tended to be higher in patients aged 50 years and older (59.7 [19.8–119.3] vs 80.2 [48.1–148.5] mg/L; p=0.056). Albumin levels were significantly lower in older patients (43.0 [40.3–46.0] vs 41.0 [39.0–43.0] g/L; p=0.010). NLR also tended to be higher in the older group (3.84 [2.66–5.17] vs 4.28 [3.29–6.19]; p=0.068). No statistically significant differences were found between the two age groups in terms of PLR, SII, or

Table 1. Comparison of demographic characteristics and systemic inflammatory indices according to age group

Variable	Patients younger than 50 years (n=64)	Patients aged 50 years and older (n=68)	p value
Age, years (mean±SD)	38.7±8.4	60.2±8.5	<0.001
Male sex, n (%)	41 (64.1)	22 (32.4)	<0.001
Diabetes mellitus, n (%)	4 (6.2)	12 (17.6)	0.082
Hypertension, n (%)	4 (6.2)	29 (42.6)	<0.001
Cardiac disease*, n (%)	2 (3.1)	10 (14.7)	0.044
Pulmonary disease**, n (%)	2 (3.1)	5 (7.4)	0.442
Renal failure, n (%)	0 (0.0)	2 (2.9)	0.497
Extra-colonic malignancy, n (%)	0 (0.0)	2 (2.9)	0.497
Previous abdominal surgery, n (%)	6 (9.4)	17 (25.0)	0.034
Distal colonic localization, n (%)	52 (81.2)	56 (82.4)	1.000
Proximal colonic localization, n (%)	12 (18.8)	12 (17.6)	1.000
Hinchey 1A, n (%)	51 (79.7)	58 (85.3)	0.536
Hinchey 1B or higher, n (%)	13 (20.3)	10 (14.7)	0.536
WBC (/μL), median [IQR]	12.96 [11.11–16.01]	12.70 [10.20–14.71]	0.244
CRP (mg/L), median [IQR]	59.65 [19.82–119.25]	80.20 [48.10–148.50]	0.056
Albumin (g/dL), median [IQR]	43.00 [40.25–46.00]	41.00 [39.00–43.00]	0.010
NLR, median [IQR]	3.84 [2.66–5.17]	4.28 [3.29–6.19]	0.068
PLR, median [IQR]	109.60 [90.14–157.04]	127.96 [101.52–171.86]	0.165
SII, median [IQR]	1028.30 [712.44–1518.64]	1100.94 [796.16–1715.06]	0.366
LMR, median [IQR]	2.56 [1.91–3.30]	2.62 [2.03–3.49]	0.682
CRP-to-albumin ratio, median [IQR]	1.14 [0.44–2.67]	1.78 [1.13–3.19]	0.045
Length of hospital stay, days (mean±SD)	4.2±2.1	4.8±3.2	0.158

SD, standard deviation; WBC, white blood cell count; CRP, C-reactive protein; NLR, neutrophil-to-lymphocyte ratio; PLR, platelet-to-lymphocyte ratio; SII, systemic immune-inflammation index; LMR, lymphocyte-to-monocyte ratio; IQR, interquartile range.

* Cardiac diseases included coronary artery disease, arrhythmia, and heart failure.

** Pulmonary diseases included asthma, chronic obstructive pulmonary disease, obstructive sleep apnea syndrome, and emphysema.

LMR. However, the CRP-to-albumin ratio was significantly higher in patients aged 50 years and older (1.14 [0.44–2.67] vs 1.78 [1.13–3.19]; p=0.045). Length of hospital stay was similar between the groups, with a mean duration of 4.2±2.1 days in younger patients and 4.8±3.2 days in older patients (p=0.158).

Regarding management, most patients were treated conservatively, which was in line with the high proportion of Hinchey 1A disease in the cohort. A limited number of patients with complicated diverticulitis required more advanced management according to disease severity. Because of the retrospective nature of the study, detailed standardized treatment and short-term complication data were not uniformly available for all patients. Nevertheless, the available records suggested that the majority of patients were managed without emergency surgery.

Discussion

This cross-sectional study compared the clinical characteristics of acute diverticulitis between patients younger than 50 years and patients aged 50 years and older. The main findings were that disease localization was similar between

age groups, the proportion of complicated diverticulitis was numerically higher in younger patients without reaching statistical significance, and systemic inflammatory burden, particularly the CRP-to-albumin ratio, was more pronounced in older patients.

The similar distribution of proximal and distal disease in both age groups suggests that colonic localization may not differ substantially according to age in this cohort. Although previous studies have suggested that right-sided diverticular disease may be more common in younger patients and may reflect a distinct clinicopathological phenotype, our findings did not demonstrate a significant age-related difference in localization (16). At the same time, the presence of comparable numbers of younger and older patients in a single-center contemporary cohort supports the view that acute diverticulitis is no longer confined predominantly to older populations.

Although the rate of complicated diverticulitis was somewhat higher in patients younger than 50 years, this difference was not statistically significant (17). Still, a more detailed view of Hinchey staging suggests a potentially relevant clinical distinction: younger patients more often had stage 1B–2 disease, whereas stage 3 disease was observed only in patients aged 50 years and older. This may indicate that while localized complicated disease can be encountered in younger individuals, older patients may be more vulnerable to advanced inflammatory presentations such as diffuse purulent peritonitis, possibly due to a greater comorbidity burden and altered physiological reserve.

The laboratory findings also support age-related differences in inflammatory response (17). CRP values and NLR were higher in the older group, and the CRP-to-albumin ratio was significantly elevated in these patients. This is clinically meaningful because the CRP-to-albumin ratio integrates both acute inflammation and nutritional or physiological reserve, and it may therefore better reflect the overall systemic burden of disease, especially in older patients. Previous studies have suggested that hemogram-derived inflammatory indices may help identify patients at greater risk of complicated diverticulitis or more severe disease (18). In the present study, however, PLR, SII, and LMR did not differ significantly between age groups (11). This may be explained by the predominance of uncomplicated cases and the relatively limited sample size.

The addition of treatment-related observations further supports the clinical interpretation of the data. Most patients were managed conservatively, which is expected in a cohort in which the majority of cases were classified as Hinchey 1A. More invasive treatment strategies were required only in a limited subgroup of patients with more severe disease. Although detailed treatment pathways and complication profiles were not uniformly available for all patients, the overall pattern suggests that disease stage remained the main determinant of management rather than age alone. Future studies incorporating standardized treatment modalities, intervention rates, postoperative outcomes, and short-term complications may help clarify whether younger and older patients differ not only in inflammatory burden but also in therapeutic needs and clinical course.

This study has several limitations. First, its retrospective design restricted the availability of certain clinical details, including standardized treatment protocols, short-term complications, recurrence, and long-term follow-up outcomes. Second, the study was conducted at a single center, which may limit generalizability. Third, the number of complicated cases was relatively low, which may have reduced the power to detect significant differences in severe disease patterns between age groups. Nevertheless, the study has important strengths, including CT-confirmed diagnosis in all patients, consistent Hinchey staging, and systematic calculation of inflammatory indices.

Overall, the findings suggest that acute diverticulitis should no longer be considered

solely a disease of older individuals. At the same time, age appears to influence the inflammatory profile of the disease, with older patients showing signs of greater systemic inflammatory burden. These findings may have implications for risk stratification and patient monitoring in daily clinical practice.

Conclusion

In this cohort of patients with acute diverticulitis, colonic localization was similar between patients younger than 50 years and those aged 50 years and older. Although complicated diverticulitis was numerically more frequent in younger patients, the difference was not statistically significant. In contrast, the significantly higher CRP-to-albumin ratio in older patients suggests a greater systemic inflammatory burden in this age group. The comparable number of younger and older patients in the same center indicates that acute diverticulitis should no longer be regarded solely as a disease of the elderly. Larger prospective studies are needed to better define age-related differences in disease severity, management strategies, and outcomes.

Ethical approval

The study was approved by the İstanbul Haseki Training and Research Hospital Ethics Committee (date: 23.06.2021, number: 58-2021).

Author contribution

Study conception and design: NA, BCT, AH; Data collection: NA, AH, BCT, SCO; Analysis and interpretation of results: NA, SCO, OHT; Draft manuscript preparation: NA, BCT, OHT. All authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

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